THE IRON TRADE REVIEW

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# Pig Iron Buying Movement Drawing Near

*According to Present Indications—Needs of Some Melters Are Urgent —Pig Prices Still Sagging—New Business in Finished Lines Light*

BY GEORGE SMART

Indications of an early buying movement in pig iron are becoming stronger. The purchase of from 12,000 to 15,000 tons by the Westinghouse Electric & Mfg. Co., and increased activity in the east will, it is believed, encourage other buyers to come into the market. In view, however, of the continued decline in prices, many buyers are still hesitating. Southern pig iron continues weak and is usually quoted at $11 to $11.25, Birmingham, for No. 2, although the Baldwin Locomotive Works purchased 1,000 tons of No. 3 on a basis of about $10.75, Birmingham, for No. 2. Buffalo iron continues to dominate the eastern pig iron situation to a very large extent. On No. 2X, the open market price is $14.50, Buffalo, but as low as $14 can be done. The malleable syndicate in New England is sounding the market and is expected to make a large purchase at a low price. Eastern merchant stocks have been greatly reduced during the year, but there was a slight increase in May. A sale of 1,500 tons of basic in Pittsburgh to the Colonial Steel Co. at $14.50, valley, indicates the present price, which has not been clearly defined. The minimum price of $15, Ironton, for southern Ohio No. 2 foundry iron has been reduced to $14.75. One dealer in charcoal iron has closed contracts for 7,000 tons during May and reports a number of good sized orders received during the first ten days in June. Prices are $16.75 to $17.75, delivered Chicago, and $16.50 to $17.50, Buffalo. The inquiry for foundry iron is coming in increasing volume in the Pittsburgh district and in some cases it is evident that the need for the iron is urgent.

**Finished Material**

In finished materials, new business continues very light. On plates and shapes prices have settled to 1.45c, Pittsburgh, except for occasional lots for prompt shipment, on which 1.50c is obtained. Attempts of buyers to place orders at lower than 1.40c on bars and 1.45c on plates and shapes have been successfully resisted by the sellers and it does not seem probable that there will be any decided decline in the heavier finished products. The Fore River Shipbuilding Co. is inquiring for 8,000 tons of plates and 5,000 tons of shapes. Formal inquiries to cover the requirements of vessel contracts now pending amount to about 30,000 tons. Bids have been taken on 3,000 tons of steel for dump barges by the Isthmian Canal Commission. The contract will probably be awarded to the Maryland Steel Co.

**Railroad Buying**

Railroad buying of the week has been very light. The orders placed with the United States Steel Products Co. include 17,000 tons of rails for South American companies. Inquiries pending include 18,000 tons of rails for the Great Northern and 12,000 to 15,000 tons for the Missouri, Kansas & Texas. The Pacific Railway of Columbia has awarded the Steel Corporation a trial order of 1,200 steel ties.

**Decline in Tonnage**

The decline in unfilled orders of the Steel Corporation in May, 654,440 tons, while the greatest in tonnage of any single month in three years, was exceeded in August and September of 1910 in percentage of loss, and does not cause any apprehension. Specifications continue to come in at a very fair rate and there is no indication of decrease in consumption of any of the leading iron and steel products.

**Coke**

The Pittsburgh Steel Co.'s recent contract for about 150,000 tons of coke for last half delivery was at $2.25, ovens. The New Jersey Zinc Co. has withdrawn its inquiry for 10,000 tons of furnace coke per month for the last half. The American Locomotive Co. is inquiring for from 10,000 to 15,000 tons of foundry coke for the year beginning July 1. Coke prices are being well maintained. At St. Louis, 7,000 tons of by-product coke have been sold for delivery over the remainder of the year.

**Cast Iron Pipe**

The water board of Hartford, Conn., will receive bids on June 16 on 15,000 tons of 42-inch pipe. Final decision will be reached this week as to whether the Warren Foundry & Machine Co. will furnish the 10,000 tons of pipe required for the New York City high pressure extension. With the gradual improvement of financial conditions, it is expected that the demand for pipe will increase. The city of Akron, O., has closed bids on 2,100 tons, on which the United States Cast Iron Pipe & Foundry Co. was the low bidder.

# "Old Fashioned Ideas of Doing Business"

## *Were Not Approved by Judge Gary, Who Was Not Always in Harmony With Corey and Schwab—Cross-Examination Continued*

On the afternoon of June 9, the cross-examination of Judge E. H. Gary, in Steel Corporation dissolution suit, was continued. His preceding testimony is given on pages 1369-1370 of this issue.

Judge Dickinson took up several works purchases made by the Corporation from time to time. Judge Gary explained that the iron ore properties, which were purchased along with the blast furnaces owned by the Union Steel Co., did not really increase the ore supply of the Corporation since this ore was necessary to supply the furnaces acquired in these transactions. Without the ore thus purchased, the Corporation would have had to dig into its own previously acquired holdings to this added extent.

The government attorney endeavored to prove that the Union-Sharon properties were a rounded-out self-contained proposition. The witness admitted that it had a 75-year supply of good ore, and that it had blast furnaces, open-hearth furnaces and finishing mills, but he said that it was not to be regarded seriously as a competitor of such concerns as the Jones & Laughlin Steel Co. Judge Gary stated further that the Union-Sharon was not at that time regarded as successful or as promising success. For one thing, he said, it did not have the organization necessary to success.

"Oh, yes they did," exclaimed Judge Dickinson.

"Whom did they have?" asked Judge Gary.

"How about H. C. Frick?"

"Oh, he did not take much active interest in that concern."

"How about John Stevenson Jr.?"

"Mr. Stevenson built plants to sell. He was a peculiarly shrewd genius."

"He had the faculty of getting in people's way and making them buy him out?"

"Yes, I guess he had."

### *Backing Was Ample*

Judge Gary admitted that the financial backing of the Union-Sharon concern was ample but he adhered to his statement that the company was not likely to be successful. He said that the plants had to be rebuilt after the Steel Corporation acquired them, especially the Sharon, Pa., plant. Not so many changes were necessary at the Donora, Pa., plant, however, as this had been well constructed under the supervision of W. H. Donner. Judge Dickinson then took up a statement by Judge Gary which appeared in the minutes of the executive committee of the Steel Corporation shortly after the Corporation was organized. At that time, Judge Gary had made the statement that "if this Corporation is to survive, it must do business in such a way and so conduct itself that none can criticise our methods." The government attorney thereupon cross-examined the witness on this statement, endeavoring to show by various records of the Corporation, that the policies which Judge Gary outlined in his direct examination were not very strictly enforced in the early days of the Corporation's existence. He took up the minutes of the meeting on May 12, 1903, in which Mr. Corey, who was at that time president, recommended that from 75,000 to 100,000 tons of pig iron be purchased at $19 a ton in order to sustain the price of pig iron current at that time, as well as the prices of finished materials. While Judge Gary, who was in attendance at this meeting, objected to the paying of such a high price for pig iron, saying that he would like to see pig iron sell at about $16.50, all the time, reluctantly gave his approval to the making of this purchase. The pig iron, accordingly, was bought at prices of $18, $18.50 and $19. Judge Dickinson wanted to know why it was that Judge Gary had given his approval to this transaction, even though he did not favor it at the terms Mr. Corey suggested.

### *Not All Harmony*

"I want to say," said Judge Gary, "that our policy with respect to dealing with customers and competitors was adopted right at the beginning of the Corporation's history. There was a great deal of opposition, however, to some of these policies on the part of those officials like Messrs. Schwab and Corey, who still retained the old-fashioned ideas of doing business, and we were unable to act in harmony on all these matters. Some of the things done at that time were sanctioned by me, but without my approval. Then, too, in the early days, one of these propositions would be brought to me and submitted for my approval and I would veto it. On these occasions, I would suppose that the matter thus settled was settled for all time, but I later found out that certain of the officials rather than come to me and get the refusal that they knew I would give, acted on their own responsibility. I was greatly surprised in the early part of 1904, to learn of a number of matters which had been decided without consulting me and I then got after these things and saw to it that they were done away with."

Judge Dickinson called attention to various minutes of the meetings of the Carnegie Steel Co. managers which were held at the formation of the Steel Corporation. At a great many of these, sentiments were expressed and remarks made which did not at all harmonize with the policy of those who controlled the Corporation. The government attorney cross examined the witness upon this subject.

### *Asks Embarrassing Questions*

"I didn't know that sort of conversation was being held by the Carnegie people as I did not always read their minutes," said Judge Gary. "As I said before, however, I saw to it that these things were stopped."

"I want to say," continued Judge Gary, "that the questions you ask me are very embarrassing to me."

"They don't embarrass me," said Judge Dickinson, with a laugh.

"They do me," repeated the witness. "I am trying to give you the facts and by your questions you are criticizing me. I don't mean anything personal by that, but I want you to understand that it was a difficult proposition at the beginning to get all the policies of the Corporation established and it naturally took some time to do it. There were many things going on that we didn't approve of and in the course of time we corrected them."

"Who shaped the policies of the Corporation?"

"All of us did."

"That is, all who were on the finance committee?"

"Yes," said Judge Gary. Previously he had stated that the only member of the finance committee who always acted in harmony with him was Mr. Roberts.

"You say you all did?" asked Judge Dickinson.

"Well, I was one," admitted the witness.

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R. P. Smith, for many years Texas state agent for the Cleveland Rolling Mills Co., Cleveland, and later a partner in Smith, Peton & Co., Houston, Tex., died recently at his home in Long Beach, Cal.

# Large Structural Contracts Are Active

## *And, it is Expected, Will Be Placed Without Delay—Good Bookings of American Bridge Co.*

New York, June 11. (By wire.)—Some unusually large structural contracts have reached active negotiations or have been placed or are going forward without further delay. The American Bridge Co. has received orders to proceed with the fabrication of 35,000 tons for the Equitable building, New York, which was originally placed as reported some months ago, but held up.

Inquiry is pending for a large riveted water line in Manitoba requiring 30,000 tons of plates. The Kansas City Terminal inquiry, 30,000 tons, is now showing activity. Structural bookings of the American Bridge Co. last week, 35,000 tons. Among others were 2,000 for the Pennsylvania bridge at Tyndell, O., and 1,000 for bridge work for the Denver & Rio Grande. The large Donahoe building, Chicago, has gone independent.

Present conditions at Chicago indicate that there are too many shops in that territory as compared with the normal volume of business. Very few large tonnages are pending at present and although there is a large number of small jobs being placed, they are insufficient to keep all of the shops in that territory occupied. Prices on fabricated material are uncertain. On the larger jobs, most fabricators are disposed to figure rather closely at present, while quoting prices on some of the smaller work that in some instances causes a selection of other methods of construction.

### CONTRACTS PLACED

Great Shoshone & Twin Falls Water Power Co., radial gates for power plant, Boise, Idaho, 178 tons, to Oma'a Structural Steel Co.

Glenn county, California, one 1,200 x 20-foot roadway highway span of reinforced concrete, near Oakland, Cal., 600 tons.

Denver & Rio Grande R. R. Co., single track steel bridges in Colorado, 935 tons, to the American Bridge Co.

Plate and jobbing mills of Otis Steel Co., Cleveland, 2,500 tons, to American Bridge Co.

Addition to Industrial building, Baltimore, 500 tons, to Lauer & Harper.

Fourth street viaduct, Columbus, O., 1,400 tons, Massillon Bridge & Structural Co.

Station at Memphis, Tenn., 900 tons, Virginia Bridge & Iron Co., Roanoke, Va.

Erecting shop, E. W. Bliss Co., Brooklyn, 600 tons, to the Hedden Iron Construction Co.

Highway bridges at Towanda, Pa., and Athens, Pa., 1,200 tons, to the Penn Bridge Co.

Loft building for Nodrog Realty Co., 108-110 West Twenty-fifth street, New York City, York City, 700 tons, to Ravitch Bros.

Loft building for Nodorg Realty Co., 108-110 West Twenty-fifth street, New York City, 500 tons, to Ravitch Bros.

Office building, New York and New Jersey Telephone Co., Brooklyn, 500 tons, to Levering & Gerrigues.

### PENDING STRUCTURAL INQUIRIES.

Addition to the Altman store, Thirty-fourth and Fifth avenue, New York City, 3,000 tons or more. Marc Edilitz & Son awarded general contract. Plans being completed.

Addition to Ritz-Carlton hotel, Philadelphia, 1,500 to 2,000 tons. Plans issued.

Office building, Wilkes Barre, Pa., for Lehigh Valley Coal Co., 500 tons. Plans in preparation. Burnham & Co., Chicago, architects.

The Ford Motor Co. contemplates the building of warehouses in several cities.

## Will Require About 30,000 Tons of Steel

Philadelphia, June 9.—Eastern shipyards continue to put out formal inquiries for round tonnages of plates and shapes to cover the requirements of some large vessel contracts which are now pending before builders as previously announced in THE IRON TRADE REVIEW.

Prices are being asked of the mills for 3,800 tons of plates and 1,900 tons of shapes, or 5,700 tons for each of three vessels making a total of 17,100 tons. These boats are those for the Hamburg-American Steamship Co. The announcement of the company was that it would build four or six vessels. Another inquiry for steel calls for 2,000 tons of plates and 1,000 tons of shapes or 3,000 tons for each of two or three vessels, making a total of 6,000 to 9,000 tons. These ships are those for the Mallory Steamship Co.

With other inquiries now pending, fully 30,000 tons of steel will be required for ship work now in prospect in the eastern market.

Bids have been taken by the Isthmian Canal Commission on six steel dump barges, requiring about 3,000 tons of steel. The Newport News Shipbuilding & Dry Dock Co. submitted the lowest bid, but did not follow the exact specifications and the Maryland Steel Co. has been recommended for the award.

The Fore River Shipbuilding Co. has put out inquiries in the eastern market for 8,000 tons of plates, 5,000 tons of shapes and a large quantity of rivets.

## WILL TREAT PYRITES

### In New Plant Being Built at Roanoke, Va.

A new plant for the treatment of iron pyrites to render it suitable for blast furnace use, is being built at Roanoke, Va., by the Pyrites Co., Ltd., and operations will be inaugurated within the next few weeks. The company building the plant is associated with the interests controlling the Reo Tinto mines of Spain, which ship iron pyrites to this country in large quantites, principally to manufacturers of sulphuric acid. After the ore has been used by these acid manufacturers and the sulphur obtained, the residue is to be collected at the new Norfolk plant, where the copper will be removed and the material sintered for the reclamation of the iron. The sintering of the ore will be carried out in a unit of the Dwight & Lloyd type, which will be of 150-ton size. Since the pyrites ore contains 60 per cent and upward in iron, and the sintered product will be about 0.02 per cent in phosphorus, it is believed that this material will be attractive to blast furnaces, particularly in the Virginia and southern districts. If the present plant proves a commercial success, its capacity will be enlarged to meet the requirements of the pig iron manufacturers using its product.

## INCREASED BOOKINGS

### By Steel Corporation—Tremendous Production For May.

New York, June 11. (By wire.)—A continuance of the record-breaking operations in steel industry is making more marked inroads into order books because new bookings are much below maximum capacities, but the larger makers still have accumulated business to warrant present activities indefinitely. Moreover, some makers, including the Corporation, report somewhat larger new business.

The Corporation's bookings for the first week in June were 30,000 daily, or several thousand better than in May. In May the Corporation's output of ingots exceeded 1,600,000 tons, and in finished 1,300,000. This production is very close to the high record. May and October usually are months of heaviest production.

Leading Pittsburgh and other large makers report they see little grounds for pessimism in the situation.

# Liberal Specifications at Pittsburgh

## *While New Business Continues Light—Sale of Basic Gives Some Insight—Coke Prices Firmly Held*

BY C. F. WILLIAMS

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg.,
Pittsburgh, June 10.

Steel products are holding firmly, new business being somewhat slack, but specifications coming in well. Mills for the most part are booked for several months and no apprehension is felt for the third quarter or even until the end of the year. The general impression is that present dullness in new business will give way shortly to resumption of ordering. The undertone of the market in semi-finished and finished goods apparently is strong, and confidence, which after all is the real test, seems to have suffered no diminution.

**Pig Iron.** — Continued inquiry is manifested in foundry iron, but steelmaking pig iron apparently is less interesting to buyers. Bessemer is practically nominal with no inquiries and no sales of magnitude. The sale of 1,500 tons of basic pig iron for delivery this month at $14.50, valley, to the Colonial Steel Co. gives the first insight into the basic market for a fortnight. This is 25 cents less than the quotations and dealers believe marks the end of the decline in this product. With considerable tonnage in the form of inquiries, the belief continues that buying must be done shortly for last half or the market will carry over July 1, simply on spot buying.

**Plates.** — Specifications for plates continue in good volume, but new business is decidedly light. Producers are not worried over the future, as old bookings are heavy. Deliveries are better than in the recent past. Plate prices are firm at 1.45c to 1.50c.

**Sheets.**—Shading on quotations of sheets for both black and galvanized continues and quotations are openly made of 2.25c for No. 28 gage black and 3.40c for No. 28 gage galvanized. The leading interest maintains 2.35c and 3.50c, respectively, on these products and with full order books sees no reason for quoting a lower price. New business in sheets is not large and while specifications continue heavy, deliveries are not much better, owing to lack of output while the shortage of steel bars continues.

**Rails and Track Material.**—The past week has been most encouraging in this line, specifications, new orders and tonnage shipped all being larger than has been the case recently and tonnage especially being maintained near record figures. Foreign demand continues and while new business for the most part is in small orders, the aggregate is comfortably large. We continue to quote Bessemer rails at 1.25c and open hearth at 1.34c.

**Billets and Sheet Bars.**—Strength continues to characterize the market for semi-finished steel products and strong demand is experienced for sheet bars, while billets are scarce. Consumers of sheet bars and billets have shown no decrease in demand and in many instances, mills have been unable to operate at full capacity from lack of steel. Borrowing has been resorted to in many instances. Sheet bars continue to be firm at $27.50, with demand far exceeding the supply.

**Hoops and Bands.**—Little new business is appearing at this season, but specifications have shown no recession and with heavy bookings, mills are operating at full capacity and making some progress in getting closer on deliveries.

**Iron and Steel Bars.**—Business in iron bars in this district is somewhat lighter, but no concessions have been made in quotations, 1.70c to 1.80c being maintained with the latter figure predominating. Some sales around 1.70c have been made of eastern bars. Steel bars are scarce and 1.40c is strong with no question as to its representing the market accurately.

**Muck Bar.**—Muck bar in the Pittsburgh district is quotable at $31.50 to $32, with few transactions, as uncertainty over the wage scale after July 1, has a restraining effect.

**Structural Shapes.**—The structural market continues to be characterized by a multitude of small contracts and both mills and fabricators are busy with orders for several months in the future. With a large tonnage pending, it is believed mills will have no trouble booking sufficient business to carry them well past the first of next year.

**Iron and Steel Pipe.**—New prices announced during the last fortnight are being well established and the market is firm. Advances on all prices of pipe have been announced and the new alignment has not slackened business. A multitude of small orders have been received by pipe makers and a number of large projects are pending which assist in giving strength to the market.

**Boiler Tubes.**—New prices reecntly announced are holding firm and business in this department has suffered no lessening in volume.

**Tin Plate.**—The tin plate market is coming to be more and more an all-year market, as makers of tin cans and other containers are developing business which is not of the seasonal variety. This results in greater stability of the tin plate trade and its effect is seen more plainly as the development proceeds. Prices on tin plate are firm and the volume of business satisfactory.

**Wire Rods.**—Unlike other products of the wire mills, wire rods are maintaining unusual strength and shading, which is present in wire and nails, is not seen in rods.

**Wire Products.**—Rumors of new quotations on wire products and nails have effectively been denied. Shading prevails, however, and present quotations are decidedly weaker. Mill capacity in this line, especially in nails, appears greater than needed and although present prices are weak, they are regarded as too low to return a reasonable profit in view of present demand for steel in semi-finished lines.

**Coke.**—Apparent slight weakening in the position of coke producers late last week seems to have been overcome this week and prices again are held firmly. Contracting is slow, although considerable quiet buying for second half has been done. The labor situation is reported better and producers maintain their firm hold on the market. Several large concerns have expressed themselves as willing to retire from the market and close their ovens rather than shade present prices.

*The Connellsville Courier* for the week ending June 5, reports the production of coke to be 401,321 as against 396,904 tons the week before.

**Old Material.** — Pronounced weakness in scrap continues to be the feature and declines of 25 cents and 50 cents are registered almost weekly. Heavy melting steel is not over $13, except in an occasional instance of a small lot of selected material. Melters have large stocks and are buying only to keep them full. Other lines of scrap are equally weak and many quotations are merely nominal, as practically no sales are being made.

# Increased Pig Iron Activity at Chicago

## *But Sales Are Still Limited—Railroad Buying at a Stand Still—Bankers' Attitude Checks Business*

BY E. R. BOYER

Office of THE IRON TRADE REVIEW,
1521-23 Lytton Bldg.,
Chicago, June 10.

The disposition of bankers, who are not taking on new business at this time, is still causing a scarcity of important sales of iron and steel in the west, and railroads have practically ceased to cover for their requirements. Financial conditions, however, are slowly improving and the peak of the load should be passed before long. Specifications in this territory are liberal from all sources, indicating a disposition to take out all contracted tonnage. Mills are still operating at a high rate and shipments during May were in some cases much in excess of productive capacity. For this reason, the total of specifications is less than of material going forward. Prices on finished material are holding up well and in spite of the efforts of agricultural interests to break the price of steel bars, quotations remain firm on the basis of 1.40c, Pittsburgh. The sheet market shows little improvement and business in wire products is notably light. Bolts, nuts and rivets, however, show signs of betterment, especially rivets, the continuation of which should have a strengthening effect on prices.

**Pig Iron.**—A few comparatively small sales reported during the last few days have caused somewhat of an appearance of activity in contrast to the general dullness heretofore. These sales include 1,200 tons of southern iron taken by the Chicago Hardware Foundry Co., a part on a basis of $11.25, Birmingham. Other sales of southern iron include several small lots for prompt shipment. One local producer yesterday reported sales aggregating 3,500 tons, including both malleable and foundry iron, on a basis of $16, furnace. Reliable inquiries pending include requirements for 2,000 tons locally and 600 tons to a nearby melter.

Foundrymen are greatly interested in the market, and while no buying movement has developed, its advent seems more probable than for some time past. Northern iron, both foundry and malleable, appears fairly firm at current quotations, the strength of the latter grade being due to the absence of outside competition. There is some reason to believe that the bottom of the southern market has been reached, as the larger Birmingham producers are holding to $11.50 for shipment in this territory and maintain that in relation to furnace costs, the $11 basis obtainable on some iron is equivalent to $10 a year or more ago. It is said that a market below $11 will cause the blowing out of many stacks in addition to the curtailments in production made recently. Some days ago, the Sloss-Sheffield company blew out a stack and is operating at less than 50 per cent of capacity. The rate of production in this territory will probably be lowered by blowing out of one Federal and one Iroquois furnace in addition to the Maryville stack already out of blast. On the other hand, the melt appears to continue at a fair rate and heavy coke contracts for a year's requirements to indicate an expectation on the part of foundrymen that it will be maintained.

**Merchant Bars.** — Notwithstanding the continued efforts of agricultural interests to break the price of steel bars, quotations remain firm at 1.40c, Pittsburgh. The buyers' reason for the delay is that the amount of tonnage carried over to the second half makes future requirements uncertain, but as their inactivity extends to hard steel bars, makers are inclined to question the sincerity of their position. Mills rolling the latter material seldom sell for delivery more than six weeks or two months ahead. In spite of low prices on re-rolling rails, which would seem to indicate lower quotations on finished material, prices on hard steel bars are fairly firm. Bar iron is quotable on a basis of 1.55c for Chicago delivery, and no sales to outside points lower than 1.50c have been noted.

**Plates and Structurals**—New business continues light with local producers, but one eastern mill reports a considerable betterment in this territory as compared to May business. Small building operations are numerous, but on account of the lack of larger projects, many fabricators are experiencing a scarcity of business. Railroad consumption of structural material is quite extensive, but the present scarcity of car orders, if longer continued, will affect the market for plates in some degree. Specifications for both plates and shapes are keeping up fairly well, although with the local mills the total is somewhat less than current shipments. This is due in part, however, to the extreme productive activity in this territory at present. Should specifications continue at the present rate, existing mill contracts would be entirely taken up in a comparatively short time.

**Rails and Track Fastenings.** — No new rail business is noted from western roads and new offerings in track fastenings continue negligible. The volume of specifications, however, is on a par with those for plates and shapes and indicates a disposition to take out all tonnage now contracted. Prices are unchanged, although the scarcity in business in track fastenings makes quotations on some items a little soft.

**Bolts, Nuts and Rivets.**—During the past week some tendency toward betterment has been noted in this market, especially in rivets. As to the latter, this is due in part to the demand caused by a large number of small structural jobs and by a stronger attitude on the part of Cleveland makers who have taken considerable business recently. Bolts and nuts have been stronger than rivets, although makers have improved deliveries, which now can be had in 30 days. Prices are unchanged.

**Sheets.**—Further declines in the price of spelter militate against any appreciable improvement in the price of galvanized sheets. This variety continues to be weakest, although some price shading on black sheets has been reported.

**Wire Products.**—Rumors of lower prices on wire products have been circulated in this territory, but the leading producers are still quoting on a basis of 1.80c, Pittsburgh, for wire nails. Business remains quiet and will probably continue so until August 1. Producers generally have something over two months' business on their books, which will enable them to operate on the present basis until that time.

**Cast Iron Pipe.** — With the gradual easing up of the monetary situation, it is likely that more pipe requirements will come out. At present, however, business continues light with more favorable indications. The city of Akron, O., has closed bids on 2,100 tons, the United States Cast Iron Pipe & Foundry Co. making the lowest offer. Other large requirements are being held up. Prices are unchanged.

**Merchant Pipe and Tubes.**—Although there are more indications of coming activity in the market for pipe and tubes, no material increase in business has developed. That the recent increase in price of $1 per ton has been well received is indicated by the fact

that there has been no cessation of demand.

**Old Material.**—Quotations indicating a rather startling weakness on some items in the old material list have been noted during the past week, but transactions have been very few. Such sales as were made have in almost every case established the marked on a lower basis. On some items, notably No. 1 busheling, prices are now below the lowest level reached during 1911, and the indications are that the bottom has not yet been reached. Railroad lists have not been well received, as dealers are not in a position to take on large tonnages and consumers are reluctant to quote except to keep up their stocks. During the past week the Santa Fe invited bids on 5,676 tons of scrap, of which the principal items were 500 tons of No. 1 cast and 500 tons of No. 1 railroad wrought. The Southern railway has sent out a large list and the M. & O. has asked for offers on a small tonnage.

# Pig Iron Buying Expected at Cleveland

## *Following the Recent Purchase by the Westinghouse Company—Heavy Movement of Iron Ore*

BY GEORGE SMART

Office of THE IRON TRADE REVIEW,
Penton Bldg.,
Cleveland, June 10.

**Iron Ore.**—Shipments of iron ore are being made rapidly, and, at the present rate, the movement for the month will be about 8,000,000 tons. There was a large fleet at lower lake docks Monday, but the boats were rapidly unloaded. For the most part, ore shippers are loading only contract vessels.

**Pig Iron.**—The purchase made by the Westinghouse Electric & Mfg. Co. aroused much interest in Cleveland, as a part of the tonnage was for Cleveland plants, but terms of the transaction have been carefully guarded and representatives of Cleveland furnaces will neither affirm nor deny that they took a part of the business, although it is very probable that the tonnage to be melted in this city was placed with Cleveland furnaces. While there has been some sounding of the market by Cleveland foundrymen, very little iron has been sold. The melt continues heavy, however, and a buying movement of good size is confidently expected to begin very soon.

**Coke.**—The Pittsburgh Steel Co.'s recent purchase of 150,000 tons of Rainey coke for last half delivery was at $2.25, ovens. There is increased inquiry for foundry grades and the usual quotation is very close to $3 for either prompt delivery or contracts.

**Finished Material.**—Some mills report a slight slackening in specifications, but there is no indication of decrease in consumption of any kind of finished product. On shapes and plates, the price has settled to 1.45c, Pittsburgh, except on occasional lots, for which slightly higher prices are paid. A sale of 500 tons for Cleveland was made at 1.50c, Pittsburgh. There is a good demand for reinforcing bars. Among the contracts pending are one for 250 tons of reinforcing bars for a building of the National Carbon Co., at Jersey City, to be erected by the Hunkin, Conkey Co., Cleveland; 150 to 180 tons for an addition to the Euclid Square garage, and 200 tons for the Cleveland Electric Illuminating Co. Low prices are still being made on bar iron in competitive territory, especially in competition with Chicago mills. Standard spikes are selling at 1.75c to 1.80c, Pittsburgh, but small spikes command a premium of $2 per ton.

**Old Materials.**—Weakness was more pronounced than ever in the scrap market last week, and dealers are far from optimistic in regards to an upturn in the near future. There is very little buying by consumers; it is said that most of them are filled for at least 60 days. Some dealers state that they do not care to sell at the present low prices and that they prefer holding their stocks. Heavy steel is quoted nominally at $11.50 to $12, but one of the leading consumers in this territory is bidding only $11.25, while other mills are out of the market.

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The Otis Steel Co., Cleveland, has awarded the American Bridge Co. a building contract covering about 2,500 tons of steel, principally for the first unit of the finishing mills of the new plant. The Morgan Engineering Co., Alliance, O., has been awarded the contract for one three-high 72-inch plate mill and two stands. The William Tod Co., Youngstown, has been awarded the contract for three jobbing mills complete.

# CARLOAD LOTS

### Represent the Buying of Pig Iron in St. Louis District.

BY E. C. ERWIN

Office of THE IRON TRADE REVIEW,
St. Louis, June 10.

**Pig Iron.**—With southern No. 2 quoted at $11, $11.25 and $11.50, Birmingham, for spot shipment, buying of pig iron in the St. Louis territory is confined to carload lots, and very few sales. Dealers seem to have all the iron they want, and are confident that lower prices will yet prevail, while dealers are exerting themselves to sell iron, and insist that prices will go higher.

There is an inquiry out for 1,200 tons of basic iron, which is regarded as the most encouraging development the market has had for some time.

Northern iron is quoted at $16, Chicago, and $15, Ironton, with inquiry and actual selling at the lowest ebb.

**Coke.**—One dealer reports a sale today of 7,000 tons of by-product foundry coke for delivery over the year in St. Louis. The price of by-product foundry is $5.80, St. Louis. Connellsville foundry and furnace coke is unchanged in prices, but the inquiry is very light.

**Old Material.**—The Southern Railway Co. will close a list for 2,000 tons of scrap iron, Tuesday, and the Frisco closed one for 500 tons today. The demand from dealers is good on old orders, but this has not tended to advance prices. It is understood that quite a large tonnage of scrap is going from this territory to Colorado, and dealers are of the opinion that when the mills are in need of material they will find a scarcity, and that prices consequently will rise. The demand for relaying rails far exceeds the supply.

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## Lake Erie Ore Receipts

Out of total shipments of 7,284,212 tons of ore during May, 5,378,814 tons went to Lake Erie ports, distributed as follows:

| Port. | Gross tons. |
|---|---|
| Buffalo | 787,814 |
| Erie | 59,214 |
| Conneaut | 1,070,843 |
| Ashtabula | 1,296,409 |
| Fairport | 362,702 |
| Cleveland | 1,073,816 |
| Lorain | 487,170 |
| Huron | 80,573 |
| Sandusky | ..... |
| Toledo | 126,469 |
| Detroit | 33,804 |
| Total | 5,378,814 |

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L. H. Atkinson, rail sales agent of the Bethlehem Steel Co., with headquarters at South Bethlehem, Pa., has sailed on an European trip.

# Pig Iron Inquiries Improve at Cincinnati

## *Price of Ironton Iron Reduced—Minimum for Southern Iron Seems to be $11, Birmingham*

BY S. G. BACKMAN

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg.,
Cincinnati, June 10.

**Pig Iron.**—The minimum price of $15, Ironton, for southern Ohio No. 2 foundry iron, which has held rather firmly for over a month, has been reduced to $14.75, Ironton, which would probably be made on any delivery during the rest of the year. Some furnaces, however, are holding at $15, and $15.50, Ironton, for any shipment.

As far as inquiries are concerned, the market is a little better. Sales have not increased to any marked extent, but they involve slightly larger tonnages than during the past two or three weeks. This indicates that a number of melters in this territory are very anxious to buy, but are undecided as to whether or not the market has reached the end of the decline that has taken place since the first of the year. They are, therefore, inquiring extensively, but sometimes without any definite idea of buying unless their efforts convince them that it is advisable to close at the present time.

As far as is generally known, the southern furnaces are holding at $11, Birmingham, as the minimum for either Tennessee or Alabama grades, but some furnaces in both states are quoting $11.25 and $11.50, Birmingham.

New inquiries in the market include 1,000 tons of Virginia iron for eastern shipment, 1,500 to 2,000 tons of foundry iron from a large eastern wheel manufacturer for its various plants, 2,800 tons of foundry iron from central Indiana, and 900 tons from north-central Ohio. Other small inquiries pending in central Ohio aggregate 1,800 tons and one from Nordyke & Marmon, Indianapolis, for 600 tons is also unclosed. The only change in the furnace situation is that the La Follette furnace, at La Follette, Tenn., has blown out for relining.

**Coke.**—The coke market continues strong and sales of both furnace and foundry coke are more numerous than for some time. It is generally stated that furnace coke for prompt shipment in the Connellsville district cannot be had below $2.10, ovens, and $2.15 is the minimum price in the Wise county district for the same delivery. Southern coke is comparatively strong with prices unchanged. In the Pocahontas and New River districts, both prompt and contract shipment quotations are the same in all cases with the exception of New River furnace coke, the prompt price of which is $2.50 to $2.60, ovens, and the contract price, $2.60 to $2.90, ovens. The sales of foundry coke are probably a little in excess of those for furnace, but the latter has gained considerably within the past week.

**Finished Material.**—Specifications for sheets continue to be received by the local mill in satisfactory lots, and it is now from six to eight weeks behind on deliveries in comparison with from five to six weeks behind about ten days ago. Conditions look favorable in that the two following months are generally good ones as far as the sheet market is concerned.

Warehouse business is holding fair, and sales are satisfactory, considering the fact that the usual spring buying has passed. Prices are the same, and are holding fairly well, including boiler tubes, which were advanced in price last week. Inquiries on hand are fairly good, and are lending encouragement to the market. They are mostly for building materials.

**Old Material.**—The scrap iron market is still more or less of a puzzle to both buyers and sellers, and quotations continue to be determined more by the conditions of the sales than anything else, and no fixed and acknowledged basis is being adhered to in most cases. It is quite probable, though, that the average prices on transactions during the past week have been slightly below those of last week, generally about 25 cents a ton. Mixed cast is selling slightly in excess of the other grades, being now quoted at from $8.25 to $8.75 per net ton. The rolling mills have been buying some bundled sheet scrap at from $7 to $7.25 per gross ton, but prices on this grade have varied considerably.

## Starting Sintering Plant

A new iron ore sintering plant of the Dwight & Lloyd type has been practically completed at the plant of the Warwick Iron & Steel Co., Pottstown, Pa., and will go in operation in the near future. The new plant will operate upon a mixture of flue dust and Mayari, Cuban, ore. The sintering of the Mayari ore will be done to alter its plastic character, which offers some difficulty for handling by mechanically filled stacks. The new plant will be of 75 tons capacity.

## BRITISH IRON TRADE

### Strike and Speculations Have Depressing Effect on Market.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., May 31.

**Pig Iron.**—The Midland pig iron trade has suffered through the tube strike, while the northern market is completely disorganized by speculative operations. Yesterday's quotation at Cleveland being on the basis of 61s 6d ($15.60). For three months' iron the quotation is 60s 6d ($14.82). The prevailing policy is to buy strictly for urgent needs. Makers are putting their spare iron into stores so that stocks have been increased this month by 26,000 tons. In the Midland district, the continuance of a strike at the tube works, carriage building and other works, made Thursday's market the worst for some years. There are at least 30,000 men on strike. A reduction has been declared in Lincolnshire pig iron, and in Birmingham on Thursday, it was possible to buy Northamptonshire iron at about 59s ($14.44), and Derbyshire iron at 61s ($14.94) or about 10s below maximum prices. Blast furnaces are becoming anxious for new business.

**Finished Iron and Steel.**—The Staffordshire finished iron trade is under the cloud of the tube strike, which has practically stopped the whole of the mills devoted to strip rolling. In the tinplate trade, there is slightly more inquiry. In the wire trade there are plenty of orders, but complaints as to unremunerative prices. The report of the North of England Board of Conciliation was issued yesterday, showing a selling average for March and April of £7 10s 2d, compared with £7 7s 3d during January and February. This will put up wages 3d per ton for puddling, and 2½ per cent for other forge and mill workers, the advance taking effect from Monday next. The report from the Midland Board is due, and it is thought likely that in this district also, an advance will take place.

In the steel trade, prices have a decided downward tendency. The Small Steel Bar Association have reduced their quotations by 10s. For other steel sections, the makers have decided against a definite reduction, although quotations are negotiated on somewhat easier terms. There is no such firmness in half-finished steel, this department having been demoralized by a big drop in foreign quotations.

# Philadelphia Buyers Need Pig Iron

## *And Inquiries Increase—Many Will Soon be Driven Into the Market—Record Outputs of Sheets*

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
611 Bulletin Bdlg.,
Philadelphia, June 10.

Signs of an awakening market in pig iron continue to be shown in eastern Pennsylvania, but buyers are holding off as long as possible because of drooping prices. Statistical conditions are favorable to producers. There is no marked change in the finished situation. New business remains moderate. The tone in scrap has improved.

**Pig Iron.**—New business is of heavier volume and consumers appear to be reaching the point where they will be driven freely into the market by their unfilled needs. Much last half requirement is uncovered. The low prices ruling, which have shown further declines are offering inducements to consumers to hold off as long as possible. Inquiries are more numerous. Foundry iron is weaker. Northern No. 2X remains openly at a minimum of $16.50, Philadelphia, but this level can be shaded 25 cents. The Baldwin Locomotive Works closed for 2,000 tons of No. 3, half of which went to an eastern Pennsylvania maker at $15.20, delivered, or a shade lower, and half to a southern furnace at $14.45, delivered, or $10.25, Birmingham. Southern makers report aggregate sales of about 2,500 tons of No. 2, much of which is for shipment outside this district at $11 to $11.25, Birmingham. It is reported $14 furnace for Virginia No. 2X can be shaded. The Pennsylvania railroad inquiry of 4,550 to 9,100 tons of foundry grades is still open and about 1,500 tons of mill forge is current and lower prices have been named to these buyers. Basic remains nominal with no inquiries. Small sales of standard low phosphorus continue at $23.50, Philadelphia. A Lebanon maker has sold 3,000 tons additional to a New Jersey buyer at $19, furnace. These makers have refused offers of $18.50, furnace. A small lot of malleable sold at $16.50, Philadelphia.

**Iron and Steel Bars.**—Of the 12,000 to 15,000 tons of steel bars annually required by farming implement manufacturers in this district, only about 3,000 to 4,000 tons is reported closed after July 1. More active buying is expected soon. New business is small and specifications lighter. One western Pennsylvania maker is still offering some quick tonnage. Bar iron is weaker and 1.45c, eastern Pennsylvania mill can be done.

**Plates.**—About 20,000 tons of ship plates for prospective new construction continues before eastern mills. New business is reported slightly larger. Production is maintained at a record gait and deliveries have shortened to two to three weeks. Eastern makers are holding to a price of 1.60c Pittsburgh, for early shipment or to the end of the year.

**Structural Material.**—Some eastern Pennsylvania shape makers report little tonnage this month, but generally new business is of moderate quantity. New lettings are few. Except in the smallest sizes, which continue far behind, the range of eastern shapes is obtainable in three to six weeks. Makers freely quote 1.45c, Pittsburgh, or 1.60c, Pittsburgh, on desirable orders, but frequently obtain more on small lots.

**Sheets.**—Leading eastern sheet makers have 10 per cent more business booked than a year ago and are producing record outputs. Miscellaneous orders are active. Prices are firm.

**Semi-Fnished Steel.**—Inquiries put out a week ago calling for about 30,000 tons of billets for third quarter and last half are still pending before eastern makers. All but 10,000 tons is for western shipment. Small lots command $28, mill, but makers will quote $27, mill on round lots for the west.

**Old Material.**—The market has a better tone, though buying is still light. Consumers bidding direct obtained less tonnage at these offers from the May railroad lists. The heavy steel brought better than $12, delivered, and the railroad brought over $14.50, delivered. The Alan Wood Iron & Steel Co. has increased its recent purchases of steel at $12, delivered, to 7,000 to 8,000 tons. This well defines the market. Railroad wrought at $14.75, delivered, has been done. Store plate is higher, 500 tons bringing $10, delivered.

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With the monthly meeting of June 4, the Philadelphia Foundrymen's Association brought its activities for the year to a close.

# PRICES DEMORALIZED

## In the Buffalo Pig Iron Market—Buyers More Interested.

BY FRANK R. DOLBEE

Office of THE IRON TRADE REVIEW,
Buffalo, June 10.

**Pig Iron.** — A schedule of the range on iron from the producers in this territory, under existing market conditions, is but approximate at the best, as each furnace interest is quoting and closing at figures widely varying on foundry and malleable. The buyers have shown a better interest in the past week, but what amounts to a demoralization in prices pervades the market at present. The range is substantially the same as last quoted, with the exception of a softening in the price of malleable, which leads in the amount of trading done. None of the furnaces here report the accumulation of stocks on their yards and stack "Y", of the Wickwire Steel Co., which has been out for relining, is to be blown in next week.

**Finished Material.**—Outside reports state that the smaller eastern mills, in a more aggressive campaign for business that the larger interests represented here, are making concessions in prices. All the leading mills and agencies in this territory are holding firmly to the same prices that have been quoted over the past six months. On the other hand, the smaller eastern mills instead of making concessions have simply taken off the premium prices of 1.60 to 1.70 f. o. b. which their mills secured on prompt delivery shipments up to recently, and are now quoting 1.50 f. o. b., their mills, on plates and shapes. This is equal to from 1 to 2 cents higher than the Pittsburgh base prices quoted by the larger producers, owing to the differences in freight. Prices are firm and the demand moderate on black and galvanized sheets. The principal interests are maintaining prices on wire products, while some of the smaller producers have softened $1 a ton. In all lines orders continue to come in against contracts. The principal mills are still so far behind on deliveries that they are not actively in the market for new business.

**Old Material.**—There has been no improvement in the market in the past week. The same degree of inactivity prevails, causing prices on old car wheels, low phosphorous, steel scrap and boiler plate sheared to fall off and the general line to soften, but not enough so to further change the schedule last quoted. There has been some trading in heavy melting steel, car wheels and low phosphorous where they could be obtained at advantageous prices.

# Pig Market in New York More Active

## *But Prices Are Weak and Buffalo Makers Are Very Aggressive — Scrap Seems to Have Struck Bottom*

BY C. J. STARK

Office of THE IRON TRADE REVIEW,
503-04 West Street Bldg.,
New York, June 10.

**Iron Ore.**—The Alan Wood Iron & Steel Co. has purchased 50,000 tons additional of Imataca, Venezuela, ore at 8 cents per unit, tidewater, for delivery within the next year. Sometime ago, as announced, this consumer contracted for 500,000 tons of this ore for five years' delivery. Practically normal labor conditions have been re-established on the Philadelphia docks and ore is being discharged freely. About 30,000 tons of Wabana, Newfoundland, ore is scheduled to arrive this month.

**Pig Iron.**—Compared with a few weeks back, the market is considerably more active both in sales and inquiry. Buyers are still timid to close ahead, but unfilled needs are forcing them more broadly to take prompt iron at least. Prices remain weak. Some Buffalo makers are very aggressive and the No. 2X market there has settled to a range of $14 to $14.50, furnace. Most of the going business is being taken by these makers. Eastern Pennsylvania makers are declining to meet this competition, especially in New England. In Virginia iron, $14, furnace, for No. 2X has been slightly shaded. Sales of the week in metropolitan and New York territory aggregate about 10,000 tons, including 2,500 tons of prompt No. 2 plain for a New Jersey machinery builder, which went largely to a Buffalo maker; 1,500 tons of early No. 2X; 1,000 tons of charcoal iron for last half and other lots. Inquiries total about 15,000 tons with two lots of 5,000 to 7,000 tons each being quietly figured. Prices below $14.50, on Buffalo malleable, are reported. A Connecticut buyer asking 1,000 to 2,000 tons of malleable has temporarily withdrawn. The Malleable Syndicate is closely following the market preparatory to large purchases.

**Ferro-Alloys.**—Light buying prevails, though carload sales of ferromanganese seem more numerous. These are usually going at $60 to $61, Baltimore.

**Plates.**—The car market remains stagnant and active inquiries are very few. Pending vessel construction upon which all eastern yards are bidding presents the leading requirements of plates now in sight. A New England yard is out for 8,000 tons for this work. New plate tonnage is increasing but slightly. Mill operations are active and quicker deliveries are offered, but eastern Pennsylvania makers are maintaining a 1.60c, Pittsburgh price.

**Structural Material.**—Light fabricated lettings in New York City still reflect the unfavorable financial conditions. New inquiries are coming out slowly. The railroads are putting out some bridge work, but this is not of large tonnage. Shape deliveries continue to be made more promptly or in from four to six weeks by eastern Pennsylvania makers who will freely quote 1.45c, Pittsburgh, on the larger offerings.

**Cast Iron Pipe.**—The water board of Hartford, Conn., will take bids on June 16 on 15,000 tons of 42-inch pipe. J. J. Mulcahy has relinquished the contract for the New York City high pressure extension and the Sarrachi-Williams Construction Co. has been formed to take up the work under the next lowest bid. Final decision will be reached this week whether the Warren Foundry & Machine Co. will furnish the 10,000 tons of pipe required. Some eastern makers report a better tonnage taken, but with others bookings have not improved.

**Iron and Steel Bars.**—Leading makers of steel bars report their delivery conditions unimproved. While some independent makers have been offering very quick shipments on some sizes, this is not of large extent. New business is light. Local mills continue to compete aggressively for bar iron business and the market is weaker.

**Coke.**—The New Jersey Zinc Co., asking 10,000 tons of furnace coke monthly, for last half, has withdrawn its inquiry. It is understood the Musconetcong furnace recently bought several months' supply. The American Locomotive Co. is inquiring for 10,000 to 15,000 tons of foundry coke for the year from July. Renewals of foundry coke contracts are numerous.

**Old Materials.**—The market has a more stationary appearance and the belief is more freely stated that prices are near bottom. Business is being done cautiously by both buyers and sellers. Holders of material seem more willing to sell at the market. Stove plate is higher at $10, delivered, eastern Pennsylvania.

# Trading at Birmingham is Local

## *And Low Prices Reported in Competitive Territory Are Not Named—Basic is Stronger*

BY W. B. NEAL

Office of THE IRON TRADE REVIEW,
Birmingham, Ala., June 10.

**Pig Iron.** — The transactions recorded locally since last report do not indicate that a new low level for prices has been reached; however, the trading was confined to local or southern territory, and it is not improbable that further decline has been suffered in competitive sections. Quotations on a basis of $11.50 per ton at Birmingham, for any delivery in the remainder of the lear, is considered the established schedule for any of the several local brands. Such figures were paid in the week for upward of 5,000 tons, but with individual requirements limited to lots of less than 500 tons. A single lot of 2,000 tons of high manganese iron sold in the week at a premium of $1 per ton over the No. 2 foundry price, and 1,500 tons of special No. 2 soft sold at such figures as to indicate a slight concession from an $11.50 per ton Birmingham basis. The requirements engaged were in practically all cases for prompt delivery, with quite a disposition on the part of those parties inquiring for future deliveries to await further developments. In the aggregate, the volume of inquiry pending is very attractive, and indicates decidedly more interest on the part of the consuming interests. More or less tonnage has been submitted from northern and eastern sections, while the larger of the local melters are negotiating tonnages for the requirement in the last half. This last has been attended with offers of $11.25, $11 and $10.50 per ton respectively for special analysis No. 2 soft, No. 2 foundry and No. 3 foundry, but so far as is known, no such offers have been accepted except probably in St. Louis territory for one particular brand. The movement of such tonnage as is

due against contracts is not being deferred, and there is no evidence of a decrease in the melt. Reports tend to show that the condition of the foundry trade is not so promising as at an earlier date in the year, yet it is not believed that curtailment in any case is being seriously considered, and when prices are established on a firm basis the tonnage engaged for the last half is expected to be practically equal to the first half engagement. Furnace order books now show that very little tonnage, comparatively, has been engaged for the last requirement, while it is quite improbable that sufficient tonnage has been stocked by founders to affect the demand.

The local market for basic is stronger with the reports of a stronger demand in the east, but there is still little tonnage available from local operations in excess of the local requirement.

Warm blast charcoal iron has not declined with the coke grades, and is bringing $24.50 to $25 per ton at furnace in such lots as are being offered. The output from both charcoal furnaces being operated in this district is well taken care of by orders, with the stock accumulation unusually small.

**Old Material.**—There is as yet practically no market for any grades of old material handled locally, and prices cannot be revised. Dealers are not adding to stocks, and as is the apparent case with consumers, are awaiting developments in the pig iron market.

## New Card on Iron Pipe

Independent manufacturers of iron pipe have issued cards effective June 2, carrying an advance of $2 per ton on all sizes of butt and lap-weld pipe.

The new card on iron pipe discounts is as follows:

**FULL WEIGHT GENUINE IRON PIPE.**

| | Butt. | | Lap. | |
|---|---|---|---|---|
| | Black. | Galv. | Black. | Galv. |
| ⅜ inch | 65 | 46 | .. | .. |
| ½ inch | 69 | 56 | .. | .. |
| ¾ to 2½ inch | 72 | 61 | .. | .. |
| 2 inch | .. | .. | 68 | 58 |
| 2½ to 6 inch | .. | .. | 70 | 61 |
| 7 to 12 inch | .. | .. | 68 | 55 |

**Extra Strong Plain Ends. Card Weight.**

| | | | | |
|---|---|---|---|---|
| ⅜ inch | 63 | 52 | .. | .. |
| ½ inch | 67 | 60 | .. | .. |
| ¾ to 1½ inch | 71 | 62 | .. | .. |
| 2 and 2½ inch | 72 | 63 | .. | .. |
| 2 inch | .. | .. | 66 | 58 |
| 2½ to 4 inch | .. | .. | 70 | 61 |
| 4½ to 6 inch | .. | .. | 69 | 60 |
| 7 to 8 inch | .. | .. | 63 | 53 |
| 9 to 12 inch | .. | .. | 58 | 47 |

**Double Extra Strong, Plain Ends, Card Weight.**

| | | | | |
|---|---|---|---|---|
| ½ inch | 57 | 49 | .. | .. |
| ¾ to 1½ inch | 60 | 52 | .. | .. |
| 2 and 2½ inch | 62 | 54 | .. | .. |
| 2 inch | .. | .. | 55 | 49 |
| 2½ to 4 inch | .. | .. | 60 | 54 |
| 4½ to 6 inch | .. | .. | 59 | 53 |
| 7 and 8 inch | .. | .. | 52 | 42 |

Plugged and reamed, 1 to 2½ inch, butt and weld, 2 inch, 2½ to 4 inch, lap and weld, will be sold at two points lower basing (higher price) than card weight pipe butt lap weld as specified.

# METAL MARKETS

## New York

June 10.

**Copper.** — Trade expectations were fully realized when the May copper statistics were published Monday. Stocks of copper decreased 8,074,883 pounds, notwithstanding production increased about 6,000,000 pounds over the output of last month. The large deliveries into domestic consumption, amounting to 81,108,312 pounds is the most favorable feature of the report. Exports aggregate 68,285,978 pounds. This item fell about 17,000,000 pounds under the exports returns made by the Custom House for May.

The market has been very quiet during the week, sales being almost entirely confined among second hands and the small producing interests at around 15.12½c for electrolytic. Leading sellers continue to hold quotations at 15.75c cash for electro, 15.87½c-16c for lake and 15.37½c for casting.

The London market for standard copper closed weak at £65 5s for spot and £65 2s 6d for three months.

Exports since June 1, are 5,270 tons.

**Tin.**—The foreign tin market has declined under liquidation forced by weakness in the security markets. Spot tin closed in London today at £205 10s and three months at £205 15s. For the first time in many months the short position sold under the price of futures. At one time there was more than £20 difference in favor of spot contracts.

In the domestic trade, there has been a better demand for tin at the low level. Spot June and July metal sold at 45.37½c on dock and in warehouse June 9. Today the market is slightly lower in sympathy with the further decline in London.

Arrivals since June 1 aggregate 595 tons and there are 2,060 tons afloat.

**Lead.**—Quotations on lead are slightly more irregular, with a lower tendency. Some sellers are offering to sell at 4.32½c, in New York while others including the leading interest are holding at 4.35c. Demand is light.

**Spelter.**—Holders of spelter have been unable to find a market at a further reduction in price to 5.25c, in New York. The metal sold on the New York Metal Exchange at 5.10c, East St. Louis, June 9.

**Antimony.**—Conditions of the antimony market are unchanged. There is little demand, with offerings free at concessions from import prices. Cookson's is 8.75c, Hallett's is 8.25c, and other prices are 7.50c to 7.75c.

## Chicago

June 10.

**New Metals.**—The market for the new metals in this territory is weak and prices are uncertain. Spelter is quoted 15c a hundred lower than a week ago and copper has also fallen off. Sheet zinc is quoted at 25c a hundred lower.

We quote, dealer's selling prices f. o. b. Chicago, as follows:

Lake copper, carload lots, 15⅜c; casting, 14⅝c; smaller lots, ¼c to ⅜c higher. Spelter, car lots, 5.20c; lead, desilverized, 4.25c; sheet zinc, $7.25, f. o. b. La Salle, in carlots of 600 pound casks; pig tin, 46.12c; Cookson's antimony, 8⅞c, other grades, 7⅝c.

**Old Metals.**—The old metals market has not reached a point that approximates the condition that is being maintained in the market for iron and steel scrap, but prices have fallen off and there is a marked scarcity of transactions. Dealers report an absence of buying on the part of brass foundries which applies to territories further east as well as to this locality. A resumption of buying to any material extent is not expected for from 30 to 60 days but it is thought that by that time many buyers will again be in the market. Present conditions indicate an entire absence of demand, as consumers had no previous opportunity to build up stocks.

We quote, dealers' selling prices f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 16¾c; copper bottoms, 12c; heavy red brass, 12c; heavy yellow brass, 11¾c; No. 1 red brass borings, 11c; No. 1 yellow brass borings, 8c; brass clippings, 10c; lead pipe, 3 9-10c; zinc scrap, 4c; tea lead, 3⅝c; No. 1 aluminum, 19c; No. 1 pewter, 32c; block tin pipe, 42c; tin foil, 38c; linotype dross, 3¼c; electrotype dross, 3¼c; stereotype plates, 4⅜c; stereotype dross, 4¼c.

## LARGEST LOSS

### Of Any Month Shown by Steel Corporation Bookings For May.

A loss of 654,440 tons in unfilled business is shown by the United States Steel Corporation as a result of its May operations. This is the largest decline shown in any single month since the monthly statements of booked tonnage were first issued three years ago. In April, the loss was 490,194 tons. Since Jan. 1, the Steel Corporation order book has been reduced 1,607,842 tons. The unfilled tonnage on May 31 was 6,324,322 tons, according to the statement issued at New York, Tuesday.

Statements of business on hand, the tonnage and percentage of increase or decline from the previous month, are as follows:

| Date. | Total. | Change, tonnage. | Change, per cent. |
|---|---|---|---|
| May 31, 1913 | 6,324,322 | 654,440— | 9.38— |
| Apr. 30, 1913 | 6,978,762 | 490,194— | 6.55— |
| Mar. 31, 1913 | 7,468,956 | 187,758— | 2.45— |
| Feb. 28, 1913 | 7,656,714 | 170,654— | 2.18— |
| Jan. 31, 1913 | 7,827 368 | 104,796— | 1.32— |
| Dec. 31, 1912 | 7,932,164 | 79,281+ | 1.01+ |
| Nov. 30, 1912 | 7,852,883 | 258,502+ | 3.40+ |
| Oct. 31, 1912 | 7,594,381 | 1,042,874+ | 15.33+ |
| Sept. 30, 1912 | 6,551,507 | 388,132+ | 6.29+ |
| Aug. 31, 1912 | 6,163,375 | 206,296+ | 3.46+ |
| July 31, 1912 | 5,957,079 | 149,773+ | 2.58+ |
| June 30, 1912 | 5,807,346 | 56,363+ | 0.98+ |
| May 31, 1912 | 5,750,983 | 86,983+ | 1.52+ |
| Apr. 30, 1912 | 5,664,885 | 360,044+ | 6.97+ |
| Mar. 31, 1912 | 5,304,841 | 149,359— | 2.79— |
| Feb. 29, 1912 | 5,454,200 | 74,479+ | 1.38+ |
| Jan. 31, 1912 | 5,379,721 | 294,960+ | 5.71+ |
| Dec. 31, 1911 | 5,084,761 | 942,806+ | 23.24+ |
| Nov. 30, 1911 | 4,141,955 | 447,627+ | 12.06+ |
| Oct. 31, 1911 | 3,694,328 | 83,011+ | 2.25+ |
| Sept. 30, 1911 | 3,611,317 | 84,668— | 2.34— |
| Aug. 31, 1911 | 3,695,985 | 111,900+ | 3.33+ |
| July 31, 1911 | 3,584,085 | 223,027+ | 7.16+ |
| June 30, 1911 | 3,361,058 | 247,871+ | 7.96+ |
| May 31, 1911 | 3,113,187 | 105,617— | 3.28— |
| Apr. 30, 1911 | 3,218,704 | 228,597— | 6.63— |
| Mar. 31, 1911 | 3,447,301 | 46,758+ | 1.37+ |
| Feb. 28, 1911 | 3,400,543 | 289,624+ | 9.31+ |
| Jan. 31, 1911 | 3,110,919 | 436,162+ | 16.30+ |
| Dec. 31, 1910 | 2,674,757 | 85,656— | 3.09— |
| Nov. 30, 1910 | 2,760,413 | 111,536— | 3.88— |
| Oct. 31, 1910 | 2,871,949 | 286,157— | 9.12— |
| Sept. 30, 1910 | 3,159,106 | 379,088— | 10.74— |
| Aug. 31, 1910 | 3,537,128 | 433,803— | 10.92— |
| July 31, 1910 | 3,910,931 | 286,863— | 6.72— |

# Prolonged Debate of the Tariff Bill

## *Will Include a Week's Talk by LaFollette and Two Weeks by Cummins—Some Senators May Not Vote*

Washington, June 10.—Strength which Republicans may be able to rally in its vote on the metal schedule when the tariff comes up in the senate would be completely demoralized if the plan of some Democratic members to prevent senators voting on any schedule in which they have personal interest were put into execution. It is not probable that such an effort would be successful, but more or less talk in this direction has been heard since the lobby investigation has been taken up by a senatorial committee.

As it is, two senators, one a Republican and the other a Democrat, who were before the committee, announced they would not vote on the metal schedule because of personal interests they have which will be affected by the tariff. In addition to these two, there were six others who have testified to possessing stock of metal industries. Out of the total of eight only one is a Democrat, showing the havoc that would be played in Republican ranks in an effort of the minority to put through or balk any legislation. Because of disaffection among the Democrats over some of the schedules it is at least possible that the Republicans could get certain concessions in their attack on the metal schedule which would allow them to win some of the many points which they will try to make. This situation will in all probability prevail, but as a matter of speculation it would be out of the question entirely if those interested in the metal schedule personally were cut off from voting.

Senator Thomas, Democrat, of Colorado, testified that he owns an interest in lead, zinc and copper mining companies, and that he would not vote on the metal schedule. He is a member of the sub-committee of the senate finance committee which has the metal schedule in charge. This sub-committee completed its work on the metal schedule the latter part of week before last. The other senator who said he would not vote on the metal schedule because of his personal interest is Senator Du Pont, Republican, of Delaware. This leaves the Democratic majority unchanged. Senator du Pont owns 1,000 shares each of Pennsylvania Steel Co. and Cambria Steel Co. stock.

Senator Oliver, Republican, of Pennsylvania, testified to owning 1,000 shares of United States Steel, preferred, and some copper stock, but said, as the copper is on the free list, it would not be affected by his vote, and contended the committee had no right to ask him how much copper stock he owns. It was his opinion the tariff will not affect the value of the steel stock he owns. Senator Stephenson, Republican, of Wisconsin, said he owned an iron ore mine. Ore, however, is on the free list. Senator Jackson, Republican, of Maryland, testified to the possession of 1,000 shares of United States Steel preferred stock; Senator Catron, Republican, of New Mexico, said he receives on an average $200 monthly from his interest in lead and zinc mines, and that his interests would be injured by the shutting down of mines following the passage of the tariff bill. Senator Root, Republican, of New York, said he owns 530 preferred shares of the Smelters' Securities Co., but that he had no personal interest in the tariff. Senator Smoot, Republican, of Utah, said he owns lead and zinc mining stock.

The present indications are that two weeks will be required in discussion of the tariff at the Democratic caucus, which may get hold of it the latter part of next week. Prolonged debate is assured in the senate, 20 Republican senators already having served notice on their party caucus that they will deliver addresses, with Senator La Follette's schedule to consume one week and Senator Cummins two weeks. Final roll call is expected about the middle of August.

## Breaks Ground for New Plant

The Crawford & McCrimmon Co., of Brazil, Ind., has just broken ground for its new factory. The machine shop will be 100 x 200 feet and the foundry 80 x 180 feet. In addition there will be an office building and power house. All buildings will be of concrete, brick and steel and absolutely fire-proof. The structural material, cranes and pattern shop equipment have already been purchased. There is still some machine shop equipment to be purchased, including planer, radial drill press, small boring mills and two lathes. The present plant will be entirely dismantled.

## PIG IRON STOCKS

**Show Decrease Since June, 1912, But Increase During May.**

Merchant pig iron stocks in the eastern Pennsylvania and Virginia districts on June 1 were only 60½ per cent of what they were on June 1, 1912. The stocks on June 1 also were less on Jan. 1 of this year.

This interesting comparison of the statistical position of the eastern market has been made from the latest statistics of the Eastern Pig Iron Association and of the Virginia Pig Iron Association, covering a total of 70 furnaces, not all of which, however, are now in blast. These figures cover in its practical entirety what is commonly considered as the eastern pig iron market.

May statistics of the Eastern Pig Iron Association showed a slight increase in stocks and a falling off in orders, especially for future shipment. In Virginia there was a continued decrease in stocks and some decrease in unfilled orders. The net result for the whole eastern district was a slight increase in stocks and a larger reduction in booked orders.

Since the recent curtailment of pig iron output was forced by unfavorable market conditions, no less than 12 merchant furnaces in eastern Pennsylvania, central Pennsylvania, in Buffalo and in other eastern districts, have been blown out. Their date of resumption is indefinite and will depend upon a considerable improvement in the present market. If present prices, which show little or no margin over cost for many eastern makers, do not improve, other furnaces will retire.

Two of the latest merchant furnaces to join the idle class are those of the Colonial Iron Co., Riddlesburg, Pa., which has gone out for relining and one of the furnaces of the Lackawanna Iron & Steel Co., Lebanon, Pa., leaving three stacks blowing in the latter group. Other merchant furnaces which have gone out in the east during the past month or two are the McCungie furnace and one Crane at Catasauqua of the Empire Steel & Iron Co.; two Hockendauqua, and one Albertis, of the Thomas Iron Co.; Sheridan, and Marshall. The large Warwick furnace at Pottstown will go out before Aug. 1. In the Buffalo district, the merchant furnaces recently idle are one Wickwire, New York State Steel and Perry, at Erie.

Much more ore than appeared likely at the opening of the season is to be shipped from the big stock pile at Corrigan, McKinney & Co.'s Great Western mine this year. It is reported now that at least 150,000 tons will be sent out.

# Largest Total Since Last August

## *In Exports of Iron and Steel Products—Value Shows Slight Loss — Imports Are Heavier*

Exports of the iron and steel tonnage lines in April showed a slight gain over those of March, and made the largest total since last August, reaching 260,440 gross tons, and making a trifle over a million tons for the first four months of the year, or an annual rate of slightly over 3,000,000 tons. This shows a slight gain, but no large one, over the average rate of 1912.

IRON AND STEEL EXPORTS, GROSS TONS.

| | April, | | Ten months ending April, | |
|---|---|---|---|---|
| | 1912. | 1913. | 1912. | 1913. |
| Scrap | 7,448 | 8,257 | 64,555 | 89,971 |
| Pig iron | 29,872 | 21,691 | 130,677 | 244,711 |
| Billets, sheet bars, etc. | 24,101 | 7,441 | 174,511 | 214,045 |
| Wire rods | 6,899 | 7,624 | 35,962 | 60,625 |
| Rails | 35,887 | 41,112 | 308,920 | 376 474 |
| Steel bars | 17,038 | 16,678 | 115,402 | 196,641 |
| Iron bars | 1,374 | 1,387 | 11,739 | 21,139 |
| Structural | 22,297 | 45,556 | 196,397 | 291,711 |
| Hoop, band and scroll | 638 | 2,171 | 6,203 | 15,981 |
| Sh'ts & plates | 47,599 | 46,820 | 363,585 | 459,062 |
| Tin plates | 11,000 | 7,521 | 61,758 | 62 036 |
| Barbed wire | 6,813 | 6,360 | 84,572 | 73,932 |
| All oth. wire | 15,900 | 9,720 | 111,530 | 115,110 |
| Cut nails | 721 | 469 | 8,692 | 4,482 |
| Wire nails | 10,064 | 2,622 | 52,424 | 46,968 |
| All other, including tacks | 846 | 444 | 10,422 | 3,604 |
| Pipes and fittings | 28,622 | 30,944 | 187,945 | 221,538 |
| Railroad spikes | * | 901 | * | 10,625 |
| Bolts, nuts, rivets, washers | * | 1,902 | * | 17,082 |
| Horse shoes | * | 57 | * | 939 |
| Cast radiators | 194 | 763 | 3,556 | 7,236 |
| Totals | 267,313 | 260,440 | 1,928,850 | 2,533,912 |

*Not stated prior to July 1, 1912.

IRON AND STEEL IMPORTS, GROSS TONS.

| | April, | | Ten months ending April, | |
|---|---|---|---|---|
| | 1912. | 1913. | 1912. | 1913. |
| Scrap | 1,403 | 3,752 | 9,834 | 33,296 |
| Pig iron | 4,683 | 14,342 | 92,920 | 127,868 |
| Blooms, billets, steel, n. e. s. | 2,462 | 1,775 | 20,069 | 16,467 |
| Wire rods | 1,261 | 1,511 | 11,782 | 12,945 |
| Rails | 60 | 725 | 2,681 | 3,646 |
| Bar iron | 1,795 | 2,646 | 19,056 | 24,389 |
| Structural | 201 | 519 | 2,661 | 4,862 |
| Sh'ts and plates | 491 | 198 | 2,226 | 3,056 |
| Tin plates | 125 | 275 | 2,688 | 2,065 |
| Totals | 12,481 | 25,743 | 163,917 | 228,594 |

The value of all iron and steel exports, including the tonnage lines just referred to, as well as machinery, hardware, cutlery, etc., showed a trifling loss in April as compared with March, but was considerably above the value in January and February. The total value in the four months of the year was $103,551,521, or at the rate of over $310,000,000 for a year, which is a gain of 7 per cent over the average of last year.

While the tonnage exports in April made substantially the same total as in April, a year ago, there being a decrease of between 2 and 3 per cent, there were considerable changes in individual items. Pig iron decreased 17 per cent, billets, sheet bars, etc., 69 per cent, tin plates 32 per cent, wire 39 per cent and wire nails 74 per cent, while rails increased 14 per cent, structural material 105 per cent and pipes and fittings 8 per cent.

IMPORTS BY MONTHS.

| | 1910. | 1911. | 1912. | 1913. |
|---|---|---|---|---|
| January | 56,207 | 33,071 | 20,008 | 21,741 |
| February | 43,613 | 20,812 | 11,622 | 24,904 |
| March | 54,176 | 23,533 | 15,466 | 27,247 |
| April | 47,698 | 22,392 | 12,481 | 25,743 |
| May | 42,569 | 23,347 | 15,955 | ..... |
| June | 30,322 | 29.399 | 21,407 | ..... |
| July | 41,933 | 15,782 | 17,916 | ..... |
| August | 36,879 | 10,944 | 80.572 | ..... |
| September | 30,961 | 14,039 | 18,740 | ..... |
| October | 31,455 | 21,035 | 25,559 | ..... |
| November | 40,585 | 13,880 | 24,154 | ..... |
| December | 31,575 | 19,665 | 21,231 | ..... |
| Totals | 487,973 | 256,903 | 225,072 | 99 635 |

IRON ORE IMPORTS, BY MONTHS.

| | 1910. | 1911. | 1912. | 1913. |
|---|---|---|---|---|
| January | 284,823 | 102,600 | 154,118 | 175,463 |
| February | 170,427 | 94,820 | 129,693 | 188,734 |
| March | 163,633 | 134,785 | 157,469 | 164,865 |
| April | 206,135 | 133,900 | 178,502 | 174,162 |
| May | 240,833 | 217,467 | 194,482 | ..... |
| June | 193,415 | 118,296 | 180,122 | ..... |
| July | 248.810 | 200,845 | 185,677 | ..... |
| August | 282,949 | 175,183 | 178,828 | ..... |
| September | 208,892 | 184,456 | 180,571 | ..... |
| October | 219,571 | 172,459 | 202,125 | ..... |
| November | 197,833 | 128,019 | 163,017 | ..... |
| December | 173,710 | 148,902 | 199,982 | ..... |
| Totals | 2,591,031 | 1,811,732 | 2,104,576 | 703,224 |

Exports of sheets are quite large, but on account of the peculiar classification in the government report the figures are not separately stated in our detailed table. The government classification divides "iron sheets and plates" into "galvanized" and "all other", and "steel sheets and plates" into "plates and sheets". This illogical classification doubtless arises from the designation by exporters of steel sheets, galvanized, as "galvanized iron". The figures as given by the government report for April are as follows:

*Sheets and Plates*

| | Pounds. |
|---|---|
| Iron:— | |
| Galvanized | 23,012,136 |
| All other | 5,694,073 |
| Steel:— | |
| Plates | 41,877,113 |
| Sheets | 27,283,213 |

On the assumption that "galvanized iron sheets and plates" really means simply galvanized steel sheets and includes no galvanized iron sheets or plates, and that none of the steel sheets reported were galvanized, it would appear that our exports of sheets in April amounted to about 22,400 gross tons, of which slightly less than half was galvanized.

*Heavier Imports*

Imports continue heavier than formerly, the April iron and steel imports amounting to 25,743 tons, of which 14,342 tons was "pig iron", including ferro-manganese, spiegeleisen, ferro-silicon, etc. Imports in the first four months of the year were at the rate of about 300,000 tons a year, against 225,000 tons in 1912.

Iron ore imports in April amounted to 174,162 tons, bringing the total for four months up to 703,224 tons, against 619,782 tons in the first four months of last year, an increase of 13 per cent.

IRON ORE IMPORTS BY ORIGIN.

| | March. | Nine months. |
|---|---|---|
| Spain | 7.227 | 87,311 |
| Sweden | 23,652 | 186,592 |
| Canada | 1,098 | 98,636 |
| Newfoundland & Labrador | ..... | 110.633 |
| Cuba | 121,450 | 1,115,623 |
| Other countries | 11,438 | 40,467 |
| | 164,865 | 1,639,262 |

A 600-ton steam hydraulic forging press has been installed by the Wright Wrench & Forging Co., Canton, O. Recent improvements place the company in a position to furnish not only its line of tools, but pressed or hammered and miscellaneous forgings of open hearth, chrome nickel or vanadium steel.

VALUE OF IRON AND STEEL EXPORTS—TONNAGE AND NON-TONNAGE.

| | 1909. | 1910. | 1911. | 1912. | 1913. |
|---|---|---|---|---|---|
| January | $10,329,388 | $14,513,394 | $18,738,391 | $18,451,914 | $25,141,409 |
| February | 10,947,159 | 13.949,082 | 18,690,792 | 21.801,570 | 24,085,871 |
| March | 13,873,746 | 17,253,503 | 22,591,991 | 24.474,799 | 27,201,197 |
| April | 13.058,297 | 16,529,260 | 24,916,912 | 26,789,853 | 27,123,044 |
| May | 12,964,367 | 17,658,042 | 20,616,795 | 28,050,247 | ..... |
| June | 13,779,736 | 16,503,204 | 20,310,053 | 24,795,802 | ..... |
| July | 11,866,772 | 16,108,102 | 17,454,772 | 24,913,052 | ..... |
| August | 14,134,487 | 17,628,537 | 20.013,557 | 25,450,107 | ..... |
| September | 12,966,908 | 16,776,178 | 19,875.308 | 23,286,040 | ..... |
| October | 14,249,598 | 17,452,085 | 20,220,833 | 25,273,059 | ..... |
| November | 14,434,690 | 18,594,806 | 20,823,061 | 26,406,425 | ..... |
| December | 15,069,246 | 18,300,710 | 22,186,996 | 23,750,864 | ..... |
| Totals | $157,674,394 | $201,271,903 | $249,656,411 | $289,128,420 | $103,551,521 |

EXPORTS OF TONNAGE LINES—GROSS TONS.

| | 1909. | 1910. | 1911. | 1912. | 1913. |
|---|---|---|---|---|---|
| January | 70,109 | 118,681 | 152,362 | 151,575 | 249,532 |
| February | 84,837 | 110,224 | 150.919 | 204,969 | 241,874 |
| March | 94,519 | 124,980 | 216,360 | 218,219 | 257,053 |
| April | 100,911 | 117,921 | 228,149 | 267,313 | 260,440 |
| May | 109,808 | 135,306 | 178,589 | 307,656 | ..... |
| June | 114,724 | 120,601 | 174,247 | 273.185 | ..... |
| July | 100,850 | 127,578 | 162,855 | 272,944 | ..... |
| August | 105,690 | 131,391 | 177,902 | 282.835 | ..... |
| September | 97,641 | 119,155 | 181,150 | 248,746 | ..... |
| October | 110,821 | 129,828 | 186,457 | 250,611 | ..... |
| November | 116,105 | 155,138 | 187,554 | 233,341 | ..... |
| December | 137,806 | 150,102 | 190,854 | 235,931 | ..... |
| Totals | 1,245,567 | 1,540,895 | 2,187,724 | 2,948,466 | 1,008,899 |

## EFFICIENCY HEARING

**Will be Conducted by Navy Department—The Taylor System.**

Washington, June 10.—Dissatisfaction of employes in the navy yards and arsenals of the country with the present wage system and working conditions and a mutual desire on their part and that of the navy department to readjust the present system, if practical, has resulted in hearings being determined upon. Secretary of the Navy Daniels and Assistant Secretary Roosevelt have, in accordance with this plan, issued requests to commandants of the east coast navy yards to let mechanics appear at the hearings, which will be held before Secretary Daniels and Assistant Secretary Roosevelt beginning tomorrow morning at 10:30 o'clock. It was explained today at the government navy yard that it is the intention to have the hearings to get at the best way to obtain data upon which the most satisfactory wage system possible can be established.

Trouble has been threatened repeatedly among employes in the navy yards and certain arsenals because they claimed they were being driven to overwork under the so-called Taylor efficiency system.

Assistant Secretary Roosevelt said yesterday that the Taylor system is not being employed by the government, but that a card system, similar in general features to the Taylor plan, is being used. It does not, however, impose such arduous machine-like duties as does the Taylor system, according to Mr. Roosevelt.

"Congress has taken a definite stand against the so-called Taylor efficiency system," said Mr. Roosevelt, "on the assumption that if carried out to its logical conclusion this system considers the working man as a machine rather than a human being. It lays emphasis solely on the amount of work which can be accomplished by the individual with the result that the men may be so driven as to impair their ultimate health and well being.

"This does not mean that the navy department opposes in any way industrial efficiency. It maintains and will continue to maintain every effort to promote the highest possible efficiency consonant with the well being and happiness of government employes. It would like to see conditions of employment by the government made as nearly ideal as possible, and in doing this is trying to get full value for its money."

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Charles H. Cramp, formerly the head of the Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, died at the home of his son in that city, June 6, after a lingering illness, aged 85 years. He was one of the best known of American shipbuilders and was famed throughout the world for his abality as a naval architect and constructor.

## INQUIRY INCREASES

**For Pig Iron in Pittsburgh—Coke Producers Resist Cutting.**

Pittsburgh, June 11. (By wire.)—An increasing flood of inquiry for foundry pig iron, with less for other varieties, indicates activity in the near future. The market seems to have a firmer tone and indications are that quotations on these inquiries are higher than those made previous to last week, an up-turn being indicated as the last half approaches. Buying by the Colonial Steel Co. for June delivery and withdrawal of inquiry for third quarter shows the efforts by melters to get lower prices for last half. While inquiries for the most part are for small tonnages, they aggregate a large total and in many instances figures are asked quickly because consumers are in immediate need.

Firmness in coke seems to be increasing and producers are resisting efforts of consumers to break the market as it is held now. Believing that present quotations are fair to the producer, the latter maintain that they will not shade prices, although contracting is slow and much tonnage remains unsold for last half.

## OPEN SHOP FIGHT

**Wins in Buffalo—Strike by the Teamsters Causes Trouble.**

Buffalo, June 10.—A general strike among the teamsters has tied up large carting companies to such an extent, since it started the first of the week, that jobbers are handicapped here by not being able to either get materials in or out of their warehouses. It is figured that this strike will affect business here to a far greater extent than the recent strike of the machinists and helpers in the shops of the city. The latter labor troubles have been wiped out. All of the shops are again running, most of them with full forces. The strikers returned under the conditions that prevailed when they went out, to have their differences adjusted between employer and employe. The Employers' Association of Buffalo was successful in its fight for a continuance of the open shop against the union or closed shop.

## RAIL BUYING

**Includes Tonnages For South American Countries.**

New York, June 11. (By wire.)—Orders placed by the United States Steel Products Co. include 17,000 tons of rails for different South American countries. The inquiry for the Great Northern, which has been reported pending, amounts to 18,000 tons. The Missouri, Kansas & Texas asks for 12,000 to 15,000 for this year. The Pacific railway, of Columbia, has given the United States Steel Corporation a trial order of 1,200 steel ties.

**PENDING BRIDGE WORK**

Pennsylvania lines east and west, 600 tons for a number of small bridges.

Baltimore & Ohio railroad about 200 tons additional issued, making with Monongahela bridge, about 3,200 tons under bid.

**CARS AND LOCOMOTIVES.**

W. R. Grace & Co. have ordered one four-wheel saddle tank locomotive for Chilean shipment from American Locomotive Co.

The Southern Railroad is inquiring for 400 hopper cars.

**BRIDGE WORK.**

The American Bridge Co. has taken about 500 tons for a number of small bridges for the Pennsylvania and Buffalo, Rochester & Pittsburgh railroads.

The Lehigh Valley Railroad, 600 to 700 tons, for several bridges. Bids entered.

## Corporation Buys Billets

New York, June 11. (By wire.)—The Steel Corporation has purchased 6,000 tons of open-hearth billets of a Cleveland maker to fill steel shortages at various works.

## Iron Workers Return

The long-standing strike of iron workers in Milwaukee, which tied up several important structural contracts, notably the 16-story First National bank building, was concluded on June 5 by mutual agreement between contractors and employes and work has been resumed. The First National steel work has rested at the 10th story since April 1.

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The next meeting of the Refractories Manufacturers' Association will be held in Cleveland at the Statler hotel, June 24. At the last meeting in Pittsburgh, May 20, forty companies, with total capacity of 85 per cent of the country's output, were represented. Prof. A. V. Bleininger, of the government bureau of standards, spoke at some length on "The Treatment of Raw Materials for the Production of High Grade Refractories." The possibilities of using and improving inferior clays were pointed out. Short addresses were made by members and guests.

# IRON AND STEEL PRICES

## Pig Iron

### PITTSBURGH

(Through Third Quarter.)

| | |
|---|---|
| Bessemer | $17.50 |
| Basic | 15.40 |
| No. 2 foundry | 15.15 to 15.40 |
| Malleable | 15.40 |
| Gray forge | 14.90 |

The freight rate from valley points is 90c.

### CLEVELAND

(Through this Year Delivered in City.)

| | |
|---|---|
| No. 1 foundry | $15.50 |
| No. 2 foundry | 15.00 |
| No. 2 southern | 15.35 to 15.60 |
| Bessemer | 17.40 |
| Silveries 8 per cent silicon | 20.55 |

### CINCINNATI

(Through This Year.)

| | |
|---|---|
| Southern foundry No. 1 | $14.75 to 15.25 |
| Southern foundry No. 2 | 14.25 to 14.75 |
| Southern foundry No. 3 | 13.75 to 14.25 |
| Southern foundry No. 4 | 13.50 to 14.00 |
| Southern gray forge | 13.25 to 13.75 |
| Mottled | 13.25 to 13.50 |
| Southern No. 1 soft | 14.75 to 15.25 |
| Southern No. 2 soft | 14.25 to 14.75 |
| Standard southern car wheel | 27.25 to 27.75 |
| Southern Ohio No. 2 | 15.95 to 16.45 |
| Southern No. 3 | 15.45 to 15.95 |
| Southern Ohio No. 4 | 15.20 to 15.70 |
| Silveries 8 per cent silicon | 19.70 to 20.20 |

### CHICAGO

(Delivered Chicago, this year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnaces.)

| | |
|---|---|
| Lake Superior charcoal | $16.75 to 17.75 |
| Northern foundry No. 2 | 16.00 to 16.50 |
| Southern foundry No. 2 | 15.60 to 16.35 |
| Jackson co. silveries, 8 per cent | 21.40 |
| South'n silveries, 5 per cent sil. | 18.35 |
| Alabama basic | 17.85 |
| Malleable | 16.00 to 16.50 |

### PHILADELPHIA

(Prompt and third quarter shipment delivered to consumer's plants, in Philadelphia and vicinity, unless otherwise specified.)

| | |
|---|---|
| Northern No. 2X foundry | $16.50 to 16.75 |
| Northern No. 2X foundry | 16.25 to 16.50 |
| Northern No. 2 plain | 15.75 to 16.25 |
| Standard forge (Eastern Pa.) | 15.25 to 15.50 |
| Virginia No. 2X | 16.80 to 17.05 |
| Southern No. 2 | 15.75 to 16.25 |
| Standard low phos., Phila. | 23.25 to 23.50 |
| Malleable | 16.75 to 17.00 |
| Basic (Eastern and Central Pa.) (nominal) | 16.50 |

### NEW YORK

(Prompt and third quarter delivery, prices based at Jersey City and tidewater.)

| | |
|---|---|
| Northern No. 1X foundry | $16.50 to 16.75 |
| Northern No. 2X foundry | 16.00 to 16.50 |
| Northern No. 2 plain | 15.75 to 16.00 |
| Virginia No. 2X | 16.55 to 16.80 |
| Southern No. 2 | 16.50 to 16.75 |
| Malleable | 16.50 to 17.00 |
| Gray forge | 15.50 to 15.75 |

### ST. LOUIS

(Throughout this year.)

| | |
|---|---|
| Southern No. 1 | $15.50 to 16.00 |
| Southern No. 2 | 15.00 to 15.75 |
| Southern No. 3 | 14.50 to 15.00 |
| Southern No. 4 | 14.25 to 14.75 |

(Freight, Birmingham to St. Louis, $3.75)

### BIRMINGHAM

(For southern delivery.)

| | |
|---|---|
| No. 1 foundry | $12.00 |
| No. 2 foundry | 11.50 |
| No. 3 foundry | 11.25 |
| No. 4 foundry | $11.00 |
| Gray forge | 10.75 |
| Mottled | 10.50 |
| Standard basic | 11.50 |
| Off basic | 11.00 |
| Charcoal | 25.00 |

### BUFFALO

(Through this year, delivered in city.)

| | |
|---|---|
| No. 1 foundry | $14.50 to 14.75 |
| No. 2X foundry | 14.25 to 14.50 |
| No. 2 plain | 14.00 to 14.25 |
| No. 3 foundry | 13.75 to 14.00 |
| Gray forge | 14.00 to 14.25 |
| Malleable | 15.00 to 15.25 |
| Basic | 16.00 to 16.50 |
| Charcoal | 16.50 to 17.50 |

## Ferro Alloys

English 80 per cent ferro-manganese, $59 to $61, seaboard, early and forward.

Fifty per cent ferro-silicon on contracts, $75, Pittsburgh, or Philadelphia, for carloads; $74 for larger lots and $73 for 600 tons or more. Twelve to 13 per cent, $26. Eleven to 12 per cent, $25. Ten to 11 per cent, $24. Nine to 10 per cent, $23, f. o. b. Globe Iisco and Ashland furnace. Freight to Pittsburgh, $1.90.

Ferro-carbon titanium 8 cents per pound for carload lots; 10 cents per pound for 2 000-pound lots and over; 12½ cents per pound in lots up to 2,000 pounds.

Freight rates on ferro-manganese, foreign spiegeleisen and electrolytic ferro-silicon from Baltimore to Pittsburgh, $2.16; to Youngstown, $2.48; to Cleveland, $2.57; to Detroit and Columbus, $2.99; to Cincinnati, $3.40; to Chicago and Milwaukee, $4.00. Freights from Philadelphia and New York, 10 and 30 cents higher respectively.

### Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 pounds, to:—

| | |
|---|---|
| New York | 16 cents |
| Philadelphia | 15 cents |
| Boston | 18 cents |
| Buffalo | 11 cents |
| Cleveland | 10 cents |
| Cincinnati | 15 cents |
| Chicago | 18 cents |
| St. Louis | 22½ cents |
| Denver | 84½ cents |
| New Orleans | 30 cents |
| Birmingham | 45 cents |
| Pacific coast, shapes and plates. | 80 cents |
| Pacific coast, sheets, No. 11 and heavier | 80 cents |
| Pacific coast, sheets, Nos. 12 to 16 | 85 cents |
| Pacific coast, sheets, No. 16 and lighter | 95 cents |
| Pacific coast, wrought pipe and boiler tubes | 65 cents |

## Coke

AT THE OVENS.

| Connellsville district: | Prompt shipment. | Contract. |
|---|---|---|
| Foundry coke | $2.85 to 3.25 | $3.00 to 3.25 |
| Furnace coke | 2.00 to 2.25 | 2.25 to 2.50 |
| Wise county district:— | | |
| Foundry coke | $2.60 to 2.75 | $2.75 to 3.00 |
| Furnace coke | 2.15 to 2.50 | 2.25 to 2.50 |
| Pocahontas district:— | | |
| Foundry coke | $2.75 to 3.00 | $2.75 to 3.00 |
| Furnace coke | 2.25 to 2.50 | 2.50 |
| New River district:— | | |
| Foundry coke | $3.25 to 3.50 | $3.25 to 3.50 |
| Furnace coke | 2.50 to 2.60 | 2.60 to 2.90 |

## Iron Ore

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, $4.40; Mesabi Bessemer, $4.15; old range none-Bessemer, $3.60; Mesabi non-Bessemer, $3.40; all at lower lake ports.

Foreign iron ores, 7½ to 8 cents per unit, f. o. b. cars eastern seaboard. Freight rates from Philadelphia to eastern Pennsylvania, furnace points range from 35 to 75 cents per ton.

## Billets and Sheet Bars

### PITTSBURGH

For prompt and forward delivery, Bessemer 4 x 4 billets with 0.25 carbon and less, $26.50 to $27.00; open-hearth rolling billets, $26.50 to $27.50; Bessemer sheet and tin bars, $27.50 open-hearth shet bars, $27.50, f. o. $27.50; open-hearth sheet bars, $27.50, f. o. b. Pittsburgh and Youngstown. Forging billets, $35, Pittsburgh.

### PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: 4 x 4-inch open-hearth and Bessemer rolling billets at $28 to $29, and forging billets at from $34 to $36.

## Standard Shapes

### PITTSBURGH

Standard structural shapes, 1.45c to 1.50c. For extras see card of Sept. 1, 1909.

### CHICAGO

Standard structural shapes, 15 inch and under, 1.63c to 1.68c.

### PHILADELPHIA

Delivered to consumers in Philadelphia and vicinity. Standard structural shapes from Eastern Pennsylvania mills on contract 1.60c to 1.65c; for prompt delivery, 1.60c to 1.70c. From Pittsburgh mills 1.60c.

### NEW YORK

Standard structural shapes for second quarter delivered at New York by eastern Pennsylvania makers 1.61c to 1.66c. On third quarter and last half contracts, Pittsburgh district makers are quoting from 1.61c to 1.66c, New York.

## Plates

### PITTSBURGH

Standard steel plates ¼ inch thick, 6¼ to 100 inches, 1.45c to 1.50c. For extras, see card of Sept. 1, 1909.

### CHICAGO

Tank plates, 1¼ inch thick, 6⅝ to 100 inches wide, 1.63c to 1.68c.

### PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity. Tank plates from eastern Pennsylvania mills for prompt or contract delivery 1.75c; universal plates 1.75c to 1.80c. From Pittsburgh mills, tank and universal plates 1.60c to 1.65c.

### NEW YORK

Steel plates, tank quality, for second quarter delivery at New York by eastern Pennsylvania makers, 1.76c. On small lots of universal plates $1 extra asked by some makers; on third quarter and last half half contracts,

Pittsburgh makers are quoting 1.61c to 1.66c, New York.

## Sheets and Tin Plate

### PITTSBURGH

| | |
|---|---|
| No. 28 black | 2.25c to 2.35c |
| No. 28, tin mill black | 2.30c |
| No. 28, galvanized | 3.40c to 3.50c |
| No. 10, blue annealed | 1.75c |
| Painted corrugated | 2.55c |
| Galvanized corrugated | 3.55c |
| Tin plate, 100 pound cokes | $3.60 |

### PHILADELPHIA

Delivered to consumers' plants in Philadelphia and vicinity: No. 10 gage annealed sheets at 1.90c.

## Pipe and Boiler Tubes

### PITTSBURGH

| | Black. Butt. | Galv. Weld. |
|---|---|---|
| Steel ¼ to 3 inches | 79 | 70½ |
| Iron, ¼ to 2½ inches | 73 | 62 |
| BOILER TUBES. | | |
| Steel, 3½ to 4½ inches | 69 | .. |
| Iron, 3½ to 4½ inches | 58 | .. |

Other sizes of pipe and tubes take the usual advances as per official cards.

## Rails and Track Material

### PITTSBURGH

Steel rails, 50-pound and heavier, 1.25c per pound for Bessemer and 1.34c for open-hearth; carload lots less than 500 tons 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.25c, schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, base, Pittsburgh; track bolts, 2.40c to 2.50c base, Pittsburgh.

Railroad spikes, 4½, 5 and 5½ and 9-16 inch, 1.80c.

### CHICAGO

Light rails, carloads, 25 to 45-pound, 1.25c, base; 16 to 20-pound, 1.30c; 12-pound, 1.35c; 8-pound, 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $22 to $23; standard section relaying rails, subject to inspection, $23 to $24.

Track fastenings, f. o. b. Joliet:

Angle bars, 1.50c; railroad spikes, 1.80c to 1.90c; smaller size spikes, 2.05c, base; track bolts with square nuts, 2.30c to 2.40c.

## Bars, Hoops and Bands

### PITTSBURGH

Common iron bars, 1.70c to 1.80c, Pittsburgh; Bessemer and open-hearth steel bars, 1.40c; plow and cultivator 1.40c; channels, angles, zees, tees, under 3 inch, 1.50c, all f. o. b. mill.

Hoops in carload lots, 1.60c, Pittsburgh, in less than carload lots, 1.65c; bands, 1.40c, base, with net extras, as per standard steel.

Cold rolled and ground shafting, 60 and 58 per cent off in carloads and 55 and 53 per cent in less than carloads delivered in base territory.

### CHICAGO

Bar iron 1.55c to 1.57½c; hard steel bars rerolled, 1.65c to 1.75c; soft steel bars, bands and small shapes, 1.58c; hoops, 1.63c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting, 58 per cent off list for carload lots, 53 per cent off for less than carloads.

### PHILADELPHIA

Delivered in consumers' plants in Philadelphia and vicinity: Steel bars 1.55c to 1.60c on contract and common bar iron, 1.52½c to 1.57½c. Prompt steel bars on mill shipments, 1.85c to 1.90c, delivered. Cut nails 1.90c to 1.95c, Philadelphia. Shafting 60 and 58 and 55 and 53 off in base territory.

### NEW YORK

Delivered in New York, steel bars on contract from 1.56c to 1.61c, and common iron bars, 1.45c to 1.60c.

## Bolts, Nuts and Rivets

### *Rivets*

Button head structural rivets, 2.15c to 2.20c, Pittsburgh, cone head boiler rivets, 2.25c to 2.30c. Small rivets, 75, 10 and 10 off.

Structural rivets, Chicago, 2.08c to 2.18c; boiler rivets, 0.10c extra.

### *Bolt and Nut Discounts*

(Delivered within a 20-cent freight radius.)

Carriage bolts, ⅜ x 6 inches, smaller and shorter, rolled threads, 75 and 10; cut threads 75 and 5; larger and longer, 70 and 2½.

Machine bolts with hot pressed nuts, ⅜ x 4 inches, smaller and shorter, rolled 75, 10, and 5; cut, 75 and 10; larger and longer, 70 and 7½.

Gimlet and cone point lag or coach screws, 80 and 10.

Hot pressed square, blank or tapped nuts, $5.70 off list; hot pressed hexagon blank or tapped, $6.30.

Cold pressed C. & T. square, blank or tapped, $5.70 off; hexagon, blank or tapped, ⅝-inch and larger, $6.60 off; ½-inch and smaller, $7.20 off.

## Wire Products

### PITTSBURGH

Wire nails, jobbers' carload lots, $1.80, retailers' carload lots, $1.85, cut nails (western makers), jobbers' lots, $1.70; painted barb wire, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, with 40c for galvanizing; plain wire to jobbers in carloads, $1.60; and to dealers in carloads, $1.65; polished staples, $1.80; galvanized staples, $2.20.

### CHICAGO

Wire nails, jobbers' carload lots, $1.93 to $1.98; retailers' carload lots, $1.98 to $2.05; retailers' less than carload lots, $2.03 to $2.08; painted barb wire, jobbers' carload lots, $1.93 to $1.98; retailers' carload lots, $2 to $2.05; retailers' less than carload lots, $2.03 to $2.08, with 40c for galvanizing; plain wire, jobbers, carload lots, $1.73; retailers' carload lots, $1.78.

## Cast Iron Pipe

### CHICAGO

Four-inch water pipe, $28; 6 to 12 inches, $27; larger sizes, $25; gas pipe, $1 a ton higher.

### NEW YORK

Six-inch pipe, 30 pounds to the foot, $23 to $25, f. o. b. New York, in carload lots.

### BIRMINGHAM

Water main: 4-inch, $20.50; 6-inch and up, $19.50. Gas main: $1 per ton higher than water main. Special fittings, $42.50 to $47.50.

## Old Material

### PITTSBURGH

(Gross tons delivered.)

| | |
|---|---|
| Heavy melting scrap | $13.00 |
| Rerolling rails | 14.50 to 15.00 |
| Malleable | 12.00 to 12.50 |
| Agricultural malleable | 12.00 to 12.50 |
| Bundled sheet scrap | 9.50 to 10.00 |
| Iron axles | 24.00 to 24.50 |
| Old iron rails | 14.00 to 14.50 |
| Stove plate | 9.50 to 10.00 |
| No. 1 wrought scrap | 14.00 to 14.50 |
| Old car wheels | 13.00 to 13.50 |
| Low phosphorus | 15.50 to 16.00 |
| Machine shop turnings | 7.00 to 7.50 |
| No. 1 busheling | 11.50 to 12.00 |
| Cast borings | 8.50 to 9.00 |
| No. 1 cast scrap | 13.00 to 13.50 |

### PHILADELPHIA

Gross tons delivered to consumers' plants in eastern Pennsylvania and western New Jersey:

| | |
|---|---|
| Old iron rails | $17.00 to 17.50 |
| Old steel rails (rerolling) | 15.00 to 15.50 |
| No. 1 heavy melting steel | 11.75 to 12.00 |
| Old car wheels | 13.00 to 13.50 |
| Old iron axles (nominal) | 25.00 to 26.00 |
| Old steel axles | 17.50 to 18.00 |
| No. 1 railroad wrought | 14.50 to 15.00 |
| Wrought pipe | 11.50 to 12.00 |
| Cast borings | 8.00 to 8.50 |
| Machine shop turnings | 8.00 to 8.50 |
| Heavy cast (broken) | 13.00 to 13.50 |
| Malleable | 12.00 to 12.50 |
| Stove plate | 9.50 to 10.00 |
| No. 1 forge | 10.00 to 10.50 |
| Low phosphorus | 16.25 to 16.75 |

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

### CLEVELAND

*Gross Tons*

| | |
|---|---|
| Old iron rails | $15.00 |
| Old steel rails (under 3 ft.) | 13.00 to 13.50 |
| Old steel rails (over 6 ft.) | 12.75 to 13.25 |
| Relaying rails | 23.00 to 25.00 |
| Old steel boiler plate | 9.00 to 9.50 |
| Malleable iron (railroad) | 12.00 to 12.25 |
| Axle turnings | 9.00 to 9.50 |
| Steel axles | 18.00 to 19.00 |
| Malleable iron (agricultural) | 10.00 to 10.50 |
| Heavy steel | 11.50 to 12.00 |
| Country mixed steel | 9.00 to 9.50 |
| Bundled sheet scrap | 8.00 to 8.50 |

*Net Tons*

| | |
|---|---|
| No. 1 R. R. wrought | $11.50 to 12.00 |
| No. 1 busheling | 9.75 to 10.00 |
| No. 1 machine cast | 11.00 to 11.50 |
| No. 1 dealers' wrought | 9.50 to 10.00 |
| Machine shop turnings | 4.50 |
| Pipes and flues | 7.50 to 8.00 |
| Wrought drillings | 4.50 |
| Cast borings | 6.00 to 6.50 |
| Stove plate | 7.75 to 8.25 |
| Wrought iron arch bars | 16.00 |
| Wrought iron piling plate | 14.00 |

### CHICAGO

(Delivered in consumers' yards.)

*Gross Tons.*

| | |
|---|---|
| Old car wheels | $14.00 to 14.50 |
| Old iron rails | 15.50 to 16.00 |
| Rerolling rails (5 ft. and over) | 12.75 to 13.25 |
| Old steel rails (3 ft. and und.) | 11.75 to 12.25 |
| Frogs, switches and guards | 10.75 to 11.25 |
| Heavy melting steel | 10.75 to 11.25 |
| Shoveling steel | 10.50 to 11.00 |

*Net Tons.*

| | |
|---|---|
| No. 1 R. R. wrought | $10.50 to 11.00 |
| No. 2 R. R. wrought | 10.00 to 10.50 |
| Arch bars and transoms | 14.50 to 15.00 |
| Knuckles, couplers and springs | 11.25 to 11.75 |
| Shafting | 15.00 to 15.50 |
| Iron car axles | 20.75 to 21.25 |
| Steel car axles | 17.00 to 17.50 |
| Locomotive tires | 12.00 to 12.50 |
| Dealers' forge | 10.00 to 10.50 |
| Pipe and flues | 7.50 to 8.00 |
| No. 1 cast | 11.25 to 11.75 |
| No. 1 busheling | 8.50 to 9.00 |
| No. 2 busheling | 6.50 to 7.00 |
| No. 1 boiler cut | 8.25 to 8.75 |
| Boiler punchings | 12.00 to 12.50 |
| Cast and mixed borings | 4.75 to 5.25 |
| Machine shop turnings | 5.00 to 5.50 |
| Railroad malleable | 11.00 to 11.50 |
| Agricultural malleable | 10.00 to 10.50 |
| Angle bars, splices, etc., iron | 14.50 to 15.00 |
| Angle bars, steel | 10.25 to 10.75 |
| Stove plate and light cast scrap | 9.50 to 10.00 |

### NEW YORK

Gross tons, New York dealers' prices at tidewater, usually, for Eastern Pennsylvania delivery:

| | |
|---|---|
| Old car wheels (nominal) | $11.00 to 11.50 |
| Steel axles | 15.50 to 15.75 |
| Old steel shafting | 14.25 to 14.50 |
| No. 1 heavy melting steel | 9.50 to 9.75 |
| No. 1 R. R. wrought | 12.25 to 12.50 |
| Wrought pipe (not galvanized) | 9.00 to 9.25 |
| Cast borings | 6.25 to 6.50 |
| Machine shop turnings | 6.25 to 6.50 |
| Heavy cast | 11.25 to 11.50 |

| | |
|---|---|
| Stove plate | $7.50 to 8.00 |
| Grate bars | 7.00 to 7.25 |

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City, and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City, and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City, and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City, and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark, $1.10 from New York.

### CINCINNATI

*Gross Tons.*

| | |
|---|---|
| Old iron rails | $12.00 to 12.50 |
| Old steel re-rolling | 10.50 to 11.00 |
| Old iron axles | 16.50 to 17.00 |
| Heavy melting scrap | 10.00 to 10.50 |
| Relaying rails | 19.25 to 19.75 |
| Bundled sheet scrap | 7.00 to 7.50 |

*Net Tons.*

| | |
|---|---|
| Old No. 1 R. R. wrought | $9.50 to 10.00 |
| No. 1 yard wrought | 7.25 to 7.75 |
| No. 1 machine cast | 9.75 to 10.25 |
| No. 1 busheling | 8.00 to 8.50 |
| Stove plate | 7.50 to 8.00 |
| Machine shop turnings | 5.50 to 6.00 |
| Cast borings | 5.25 to 5.75 |
| Heavy turnings | 5.75 to 6.25 |
| Mixed cast | 8.25 to 8.75 |
| Breakage | 6.00 to 6.50 |
| Malleable | 7.50 to 8.00 |

### BIRMINGHAM

| | |
|---|---|
| Old iron axles, (light) | $15.00 to 15.50 |
| Old steel axles, (light) | 15.00 to 15.50 |
| Old iron rails | 13.50 to 14.00 |
| No. 1 R. R. wrought | 12.00 to 12.50 |
| No. 2 R. R. wrought | 10.00 to 10.50 |
| No. 1 country wrought | 9.50 to 10.00 |
| No. 2 country wrought | 8.50 to 9.00 |
| No. 1 machinery cast | 9.50 to 10.00 |
| No. 1 steel scrap | 10.50 to 11.00 |
| Tram car wheels | 10.50 to 11.00 |
| Standard car wheels | 12.00 to 12.50 |
| Light cast and stove plate | 8.25 to 8.75 |

### BUFFALO

| | |
|---|---|
| Heavy melting steel | $11.50 to 12.00 |
| No. 1 R. R. wrought scrap | 13.50 to 14.00 |
| No. 1 R. R. and mch. cast scrap | 13.50 to 14.00 |
| Old steel axles | 17.50 to 18.00 |
| Car wheels | 13.75 to 14.50 |
| Railroad malleable scrap | 12.50 to 12.75 |
| Wr'ght iron and soft steel turn. | 6.00 to 6.50 |
| Cast iron borings | 7.50 to 8.00 |
| Low phos. steel scrap | 16.50 to 17.00 |
| Old iron rails | 15.00 to 15.50 |
| Boiler plate, sheared | 13.00 to 13.75 |
| Stove plate (net ton) | 9.75 to 10.00 |
| Locomotive grate bars | 10.00 to 10.50 |
| No. 1 busheling scrap | 10.50 to 11.00 |
| No. 2 busheling scrap | 8.00 to 8.50 |

### ST. LOUIS

(Dealers' buying prices.)

*Gross Tons*

| | |
|---|---|
| Old car wheels | $13.50 to 14.00 |
| Old iron rails | 13.00 to 13.50 |
| Rerolling rails (5 ft. and over) | 13.25 to 13.50 |
| Old steel rails (3 ft. and und.) | 11.00 to 11.50 |
| Light sec. relayers (45 pounds and under) subject to inspec. | 23.50 to 24.50 |
| Relaying rails, subject to inspec. | 23.50 to 24.50 |
| Frogs, switches and guards | 11.25 to 11.50 |
| Heavy melting steel | 10.75 to 11.25 |
| Shoveling steel | 9.25 to 9.75 |

*Net Tons*

| | |
|---|---|
| No. 1 railroad wrought | $11.00 to 11.50 |
| No. 2 railroad wrought | 10.50 to 11.00 |
| Arch bars and transoms | 13.50 to 14.00 |
| Knuckles, couplers, springs | 10.00 to 10.50 |
| Shafting | 13.50 to 14.00 |
| Steel car axles | 17.50 to 18.00 |
| Iron car axles | 19.00 to 19.50 |
| Locomotive tires | 11.00 to 11.50 |
| Pipe and flues | 6.50 to 7.00 |
| Tank iron and cut boilers | 6.50 to 7.00 |
| No. 1 cut busheling | 9.50 to 10.00 |
| No. 2 cut busheling | 7.50 to 7.75 |
| Cast and mixed borings | 6.25 to 6.75 |
| Machine shop turnings | 7.25 to 7.75 |
| Railroad malleable | 10.50 to 11.00 |
| Agricultural, malleable | 9.00 to 9.50 |
| Stove plates | 7.00 to 7.25 |
| Angle splice bars (iron) | 12.50 to 13.00 |
| Angle splice bars (steel) | 11.00 to 11.25 |

## Store Prices

### CINCINNATI

Steel bars, 2.10c; iron bars, 2c; plates and shapes, 2.20c; sheets, blue annealed No. 10, 2.40c; black, No. 28, 2.85c; galvanized, No. 28, 3.95c; cold rolled shafting, round, square, hexagon and flat, 50 off.

### CLEVELAND

Steel bars, 2.10c; plates and shapes, 2.25c; iron bars, 2.05c; sheets, No. 10 blue annealed, 2.40c; No. 28 black, 2.85c; No. 28 galvanized, 3.95c.

### CHICAGO

Steel bars, 1.95c; iron bars, 1.95c; hoops, 2.50c; shapes and plates, 2.05c; No. 10 blue annealed sheets, 2.25c; black, No. 28, 2.90c; galvanized, No. 28, 4.15c.

### PHILADELPHIA

Steel bars 2.05c to 2.10c; structural shapes, 2.00c to 2.10c; plates, 2.00c to 2.10c.

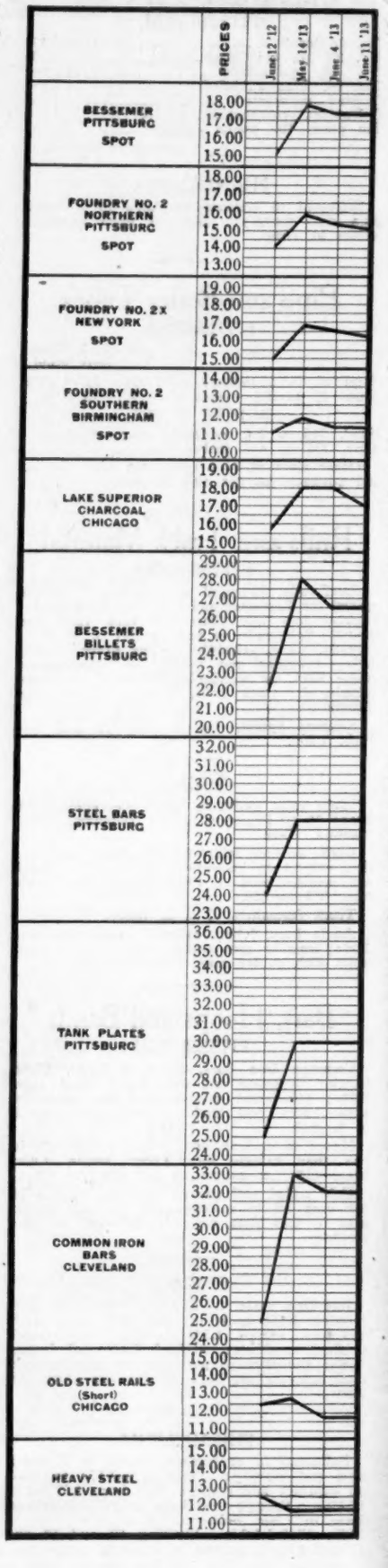
### NEW YORK

Steel bars, 2.05c; structural shapes, 2.15c; plates, 2.15c.

## Convention Committee

Chicago, June 10.—The organization of the general committee which will have charge of local arrangements for the conventions of the American Foundrymen's Association, the American Institute of Metals and the Associated Foundry Foremen, which will be held in Chicago, Oct. 10 to 17, has been completed. As previously announced, Charles A. Plamondon, president of the A. Plamondon Mfg. Co., has been chosen chairman of the general committee. David R. Forgan, president of the National City Bank, will act as treasurer, and H. Cole Estep, associate editor of THE IRON TRADE REVIEW, has been appointed secretary. The finance committee will be headed by J. A. Galligan, in charge of the coke sales department of Pickands, Brown & Co.; William Francis, of Francis & Nygren Foundry Co., will be chairman of the reception committee, and James Wood, president of the Sheffield Foundry Co., will head the entertainment committee. The publicity work for the convention will be in charge of O. J. Abell, western editor of *The Iron Age*, who has been appointed chairman of the publicity committee. A round-up and beefsteak dinner was held by the Chicago Foundrymen's Club at the Stock Yards Inn, Forty-second and Halsted streets, on Saturday evening, June 7. This location was chosen in order that the diners might become familiar with the building in which the exhibition of foundry supplies and equipment will be held next October. The meal was served in the beautiful arched main dining room of the Inn and about a hundred persons sat at the round tables.

## PRICE CHART



# A Well-Designed Rolling Mill Boiler Plant

*The Coal and Ashes Are Handled by Novel Methods, the Boilers Are Stoker-Fired and the Plant is Unusually Well-Arranged*

In rolling mills where the generation of a large amount of steam power is necessary, the economic and efficient operation of the boiler house is an important factor. With this end in view, therefore, the boiler houses of manufacturing plants of this type are receiving more attention than heretofore and many labor-saving features now are embodied in their design. The new boiler plant of the Newport Rolling Mills, Newport, Ky., has been built to comply with the requirements of the most modern practice and is designed to insure convenience of operation and the handling of materials.

In the operation of the boiler house there are several details of specific interest, one of which is the handling of the fuel. The railroad cars containing coal are run over a switch to the side of the building where the coal is discharged into a hopper of about 50 tons capacity. The coal can be discharged into this hopper from either dump-bottom or side-dump cars. From the hopper the coal is delivered by a chute into a small car in the pit underneath the boiler house, as shown in Fig. 5. This pit adjoins the ash pit, the level of both being slightly lower than that of the hopper. The pit car with its load of coal is hoisted by a traveling crane to the top of the building and then is carried over the coal bunkers, where it is dumped. From the bunkers the coal is discharged through chutes to the stokers. Only crushed coal can be used and the Newport Rolling Mills purchase the fuel in this form, but if necessary, a small crusher could be placed directly beneath the hopper and the coal could be crushed as soon as it is dumped from the railroad car.

FIG. 2—A VIEW OF THE COAL BUNKERS, SHOWING THE CRANE AT ONE END OF THE BUILDING

FIG. 1—THE BOILERS, SHOWING THE STOKERS AND THE COAL CHUTES FROM THE HOPPERS

A car similar to the one that receives the coal from the hopper, is in the ash pit directly underneath the boilers. When filled with ashes, it is run out on a track to a small turntable, by means of which it is switched to a track leading to the pit of the boiler house and is delivered to the same point where the other car stands when receiving coal from the hopper. The ash then is hoisted by the same crane that elevates the coal car and its contents are discharged into an ash bunker at one end of the building directly in line with the coal bunkers. From the ash bunker the ashes are discharged from a chute extending through the side of the build-

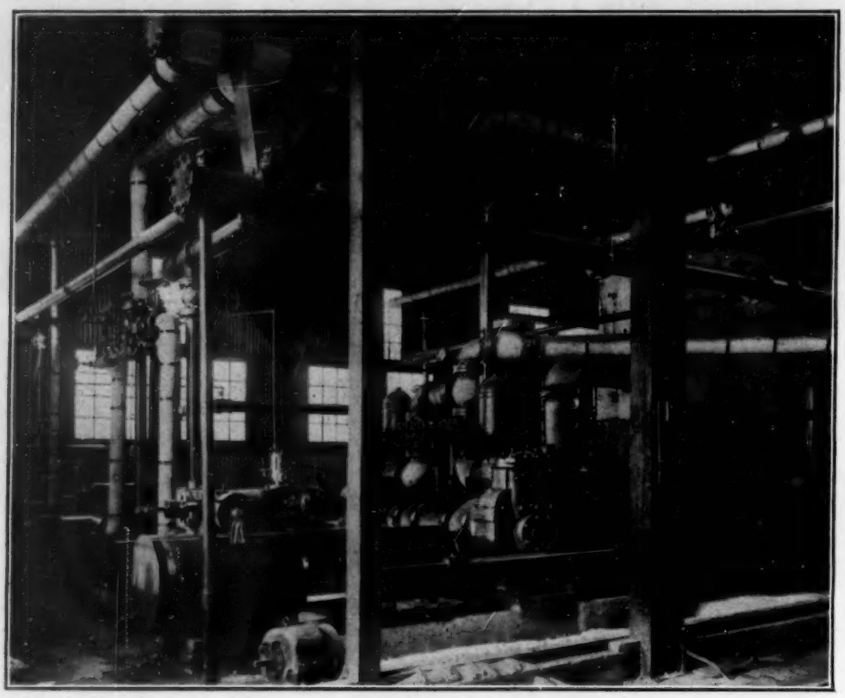


FIG. 3—THE BOILER FEED PUMPS

ing, into a freight car on a track at the yard level. If necessary, the same coal car that previously had its contents discharged into the hopper can be loaded with ashes, as the ash bunker is located at the same end of the building as the hopper. The freight car need not be moved from the time it is unloaded until it has been loaded with ashes, and, therefore, considerable switching time is saved.

The boiler house is 45 x 100 feet, and it is equipped with three boilers, each of 500 horsepower capacity, which are located in the center of the building. At one side of the boilers are the feed pumps, and at the other side is the pit from which the coal and ashes are elevated. There are two feed pumps, each with a capacity of 8,000 gallons per hour. They are set on concrete foundations and are operated alternately.

The three coal bunkers have a capacity of about 150 tons each. They are made of steel plates reinforced with small trusses and are 20 feet long, 20 feet wide and 10 feet deep. They are located directly in front of the boilers, but slightly above them. The distance from the floor of the boiler house to the top of the bunkers is 30 feet. One boiler is fed from each bunker through separate chutes that lead to the stokers, but they are so arranged that if one bunker should be empty at any time, a connection can be made to the bunker directly opposite and the stokers fed in the same way. The coal hopper which receives the coal after it is dumped from the railroad cars is also made of steel plates and is 12 x 12 feet and 6 feet deep. It is set in the ground directly beneath the railroad tracks and has a capacity of about 50 tons. The hopper tapers toward the bottom, having an opening 2 feet square to which a chute is attached, extending at an angle of 45 degrees into the pit of the boiler house. The chute is provided with a sheet iron door which is operated from the cab of the traveling crane. When a pit car is to be filled with coal, it is pushed underneath the chute, and the crane operator opens the hopper door. When the car is filled, the door is closed and the car is hoisted to the coal bunkers and dumped.

The ash bunker is on a level with the coal bunker and is 13 x 19 feet and 12 feet deep. It is located in line with the coal bunkers, but is separated from them by a distance of 15 feet. Through this opening the coal and ash cars are elevated. The ash bunker also is constructed of steel plates, and a steel chute, about 18 inches square, leads from it through the side of the building. The ashes are elevated from the pit to the bunker, and then are discharged into a car at the side of the building. The door of the chute is also operated from the cab of the crane.

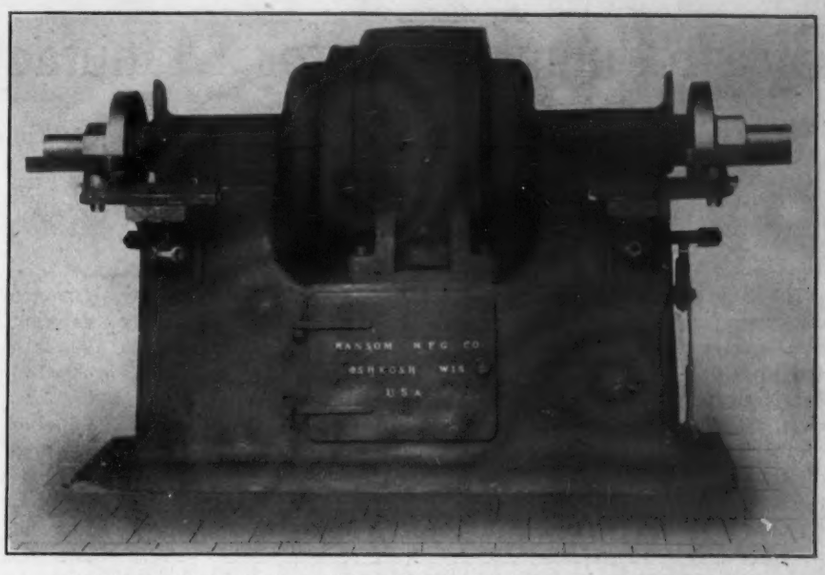
The crane operates in a tower built over the bunkers, the top of which is 50 feet from the boiler house floor. The crane was built at the plant of the Andrews Steel Co., which is operated in conjunction with the Newport Rolling Mills. The span of the crane is 16 feet and its capacity is 7½ tons. Two stairways running over each end of the boilers, extend to the crane and bunkers. The building was erected under the supervision of A. K. Andrews, general manager of the Newport Rolling Mills.

FIG. 4—THE CRANE IN POSITION OVER THE ASH BUNKER

## Temperature and Transmission Diagrams for Air

The steadily increasing demand for labor-saving devices by manufacturing, mining, building, tunneling and other industrial enterprises has resulted in a more general use of compressed air. While great economies result from the use of air appliances, frequently their unintelligent use or installation reduces the saving which otherwise might be effected. Calculations involving the expansion, compression and transmission of compressed air are somewhat difficult to make. To permit the accurate solution of such problems, graphically, three charts and a bulletin have been prepared by C. R. Richards, professor of mechanical engineering of the University of Illinois. The bulletin presents the theory and use of the entropy-temperature and the entropy-log temperature diagrams, by the aid of which all problems pertaining to the expansion and compression of air may be solved graphically, and an air transmission diagram for determining graphically the size of pipe required to transmit a given quantity of air through a given distance with any assumed loss of pressure. The bulletin further discusses the conditions affecting the maximum power which may be transmitted through pipe lines carrying compressed air, and the general efficiencies of power and pressure transmission.

The subject, while handled in a technical manner, will prove of interest to engineers who are conversant with the methods of calculating the expansion, compression and transmission of compressed air.




MOTOR-DRIVEN DRY GRINDER BUILT BY THE RANSOM MFG. CO.

## Motor-Driven Grinder

A motor-driven dry grinder, provided with a 3-inch spindle, built by the Ransom Mfg. Co., Oshkosh, Wis., is shown in the accompanying illustration. It will be noted that the armature shaft is extended to receive emery wheels on both ends. The machine can be furnished either with direct or alternating current motors and when equipped with a direct current drive, a speed controller is attached which eliminates the possibility of operating the emery wheels at too high speeds. Steel guards with exhaust pipe connections will be furnished if desired. The total length of the spindle is 80 inches and the bearings, 3¼ x 15 inches. The motor generally furnished is of 10 horsepower capacity, although 15 horsepower can be provided. The machine is designed for operating two 24 x 4-inch emery wheels for heavy steel casting work, but wheels of larger diameter can be attached. The motor is entirely enclosed and the frame of the machine is of the box type.

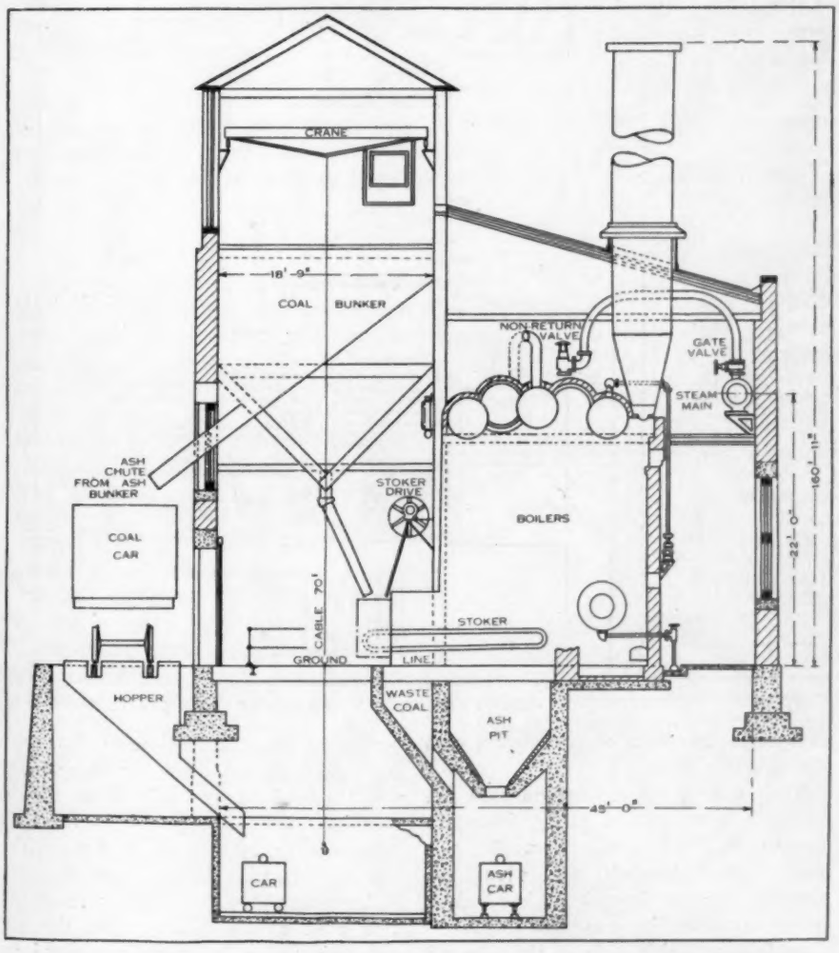



FIG. 5—SIDE ELEVATION OF THE BOILER HOUSE

The industrial consumption of oxygen in Germany in 1912, was estimated at 317,790,000 cubic feet; in France, 88,275,000 cubic feet were used. A large amount of this oxygen was used by the railroads in their repair shops, one French road having consumed over 2,500,000 cubic feet.

# By-Product Ovens for Manufacture of Coke---II

*The Construction and Operation of the Various Types Are Discussed and the Economies Effected by the Use of This Fuel Are Pointed Out*

By C A Meissner

The Semet-Solvay recuperative retort coke oven, until recently, has been entirely non-regenerative but recuperative, and heating is performed in horizontal flues instead of in vertical flues. The most modern plant in this country is of the six-flue type, which is the result of gradual evolution from the original three-flue oven. Gas for combustion is supplied to each horizontal flue from a burner pipe entering at the end of the flue.

The air for the combustion of the gas is drawn by stack draught through the recuperators into risers at the ends of the oven, whence it passes through an opening at the end of the flue into the horizontal heating flues, the amount of air being regulated by a sliding brick for each flue.

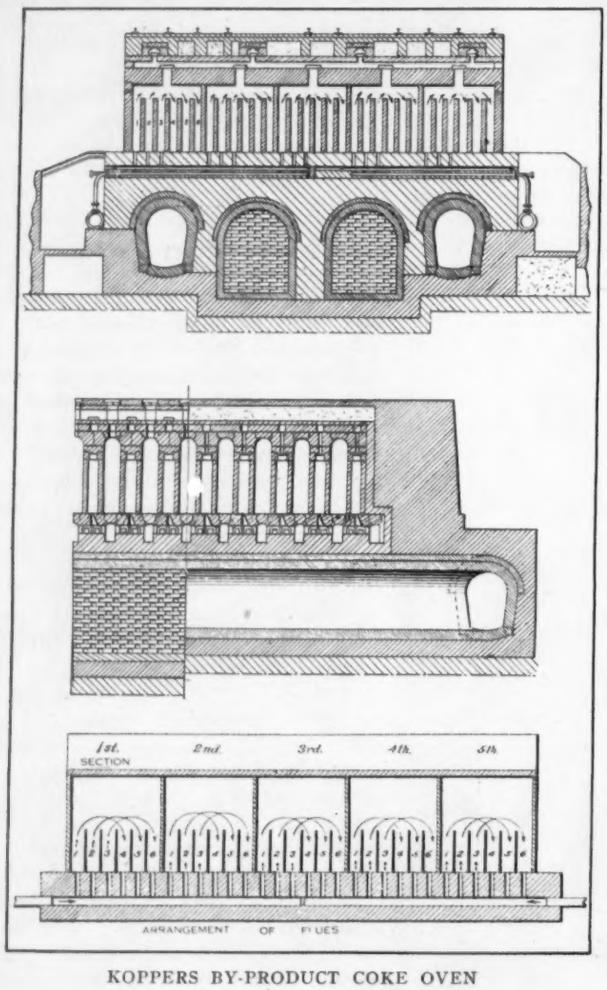
Combustion starts in the top flue and the products of combustion traverse each horizontal flue, the necessary amount of heat to maintain a uniform temperature being obtained by the admission of fresh air and gas into each horizontal flue as required. To allow for the greater volume of products of combustion, the flues gradually increase in size until the bottom flue is reached; this is reduced in size, as only a portion of the products of combustion pass through this flue.

The products of combustion pass out into the recuperators, partly from the bottom flue and partly from the sole flue located beneath the oven, the amount to pass through each of these being regulated by a sliding brick.

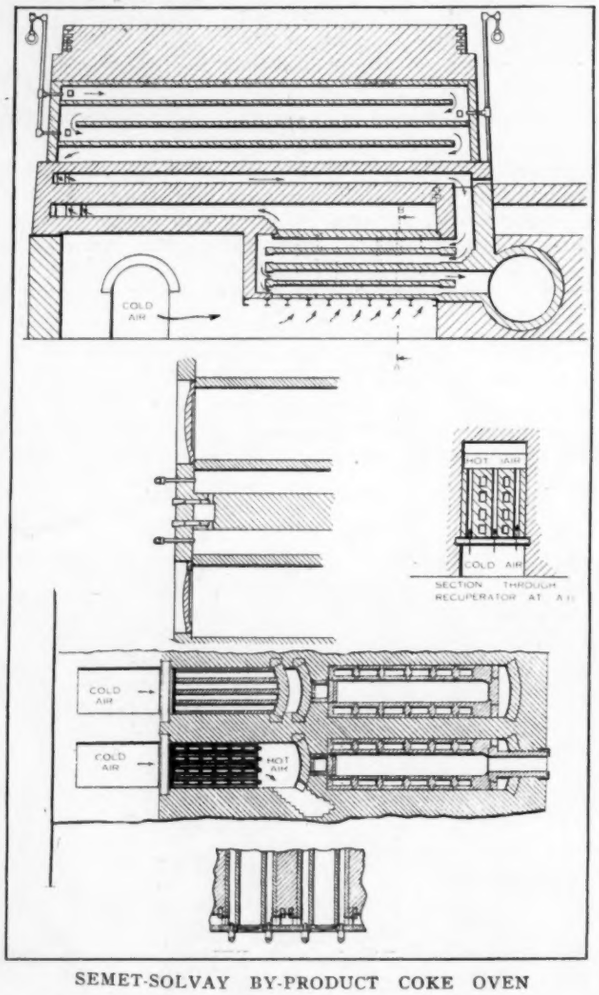
A feature which adds to the strength of the Semet-Solvay oven is a 24-inch division wall between the ovens. This allows the operation of an adjoining oven, while an oven is being repaired.

One of the more recent developments of the Semet-Solvay type is the regenerative oven. A pair of regenerators are located beneath each oven, with the chimney flues between them. The reversal of the gases takes place throughout the entire system of regenerators and horizontal flues, so that during one period of reversal the gases flow upward through the flues, and during the other period, downward. The gas is supplied continuously, and is reversed automatically by the gas currents without any attention by the operator.

As compared with the older recuperative oven of the Solvay type, the regenerative oven is especially adapted to coking conditions requiring the highest temperatures and to installations where




KOPPERS BY-PRODUCT COKE OVEN




SEMET-SOLVAY BY-PRODUCT COKE OVEN

the maximum amount of surplus gas is desired and the utilization of the waste heat for steam raising is of comparatively minor importance. Even in this type of oven it may sometimes be economical to introduce waste heat boilers between the regenerators and the chimney because the air has capacity for taking up only a portion of the heat delivered by the products of combustion. The selection of the recuperative or the regenerative type of oven has in each case to be determined by the commercial and operative conditions existing at the plant in question.

*Koppers Oven*

In the Koppers retort coke oven, heating is performed on each half of the oven alternately, reversal being made each half hour. Air for combustion is delivered from the regenerators into each vertical flue through individual openings in the roof of the regenerator chamber.

Gas for combustion is introduced from the gas main into a fire brick gas duct, located below the vertical flues, and provided with an individual opening to each vertical flue. The gas enters the vertical flue through a fire clay nozzle placed in the gas duct opening, the size of the nozzle opening depending on its location in the oven.

The air meets the gas in the vertical flue at a point about 10 inches above the gas nozzle, combustion occurs and the products of combustion enter a horizontal flue and are drawn down through the vertical flues on the other half of the oven into the regenerators and thence to the stack.

Individual regulation of the draught is accomplished by a sliding brick in each vertical flue, which controls the size of the opening into the horizontal flue. This is to overcome the tendency of the gases to take the shortest route to the chimney, which would result in the center flues taking away the bulk of the hot gases and, therefore, causing unequal heat.

Access to this sliding brick is afforded by an opening to each vertical flue from the top of the oven, this opening normally being closed by a plug.

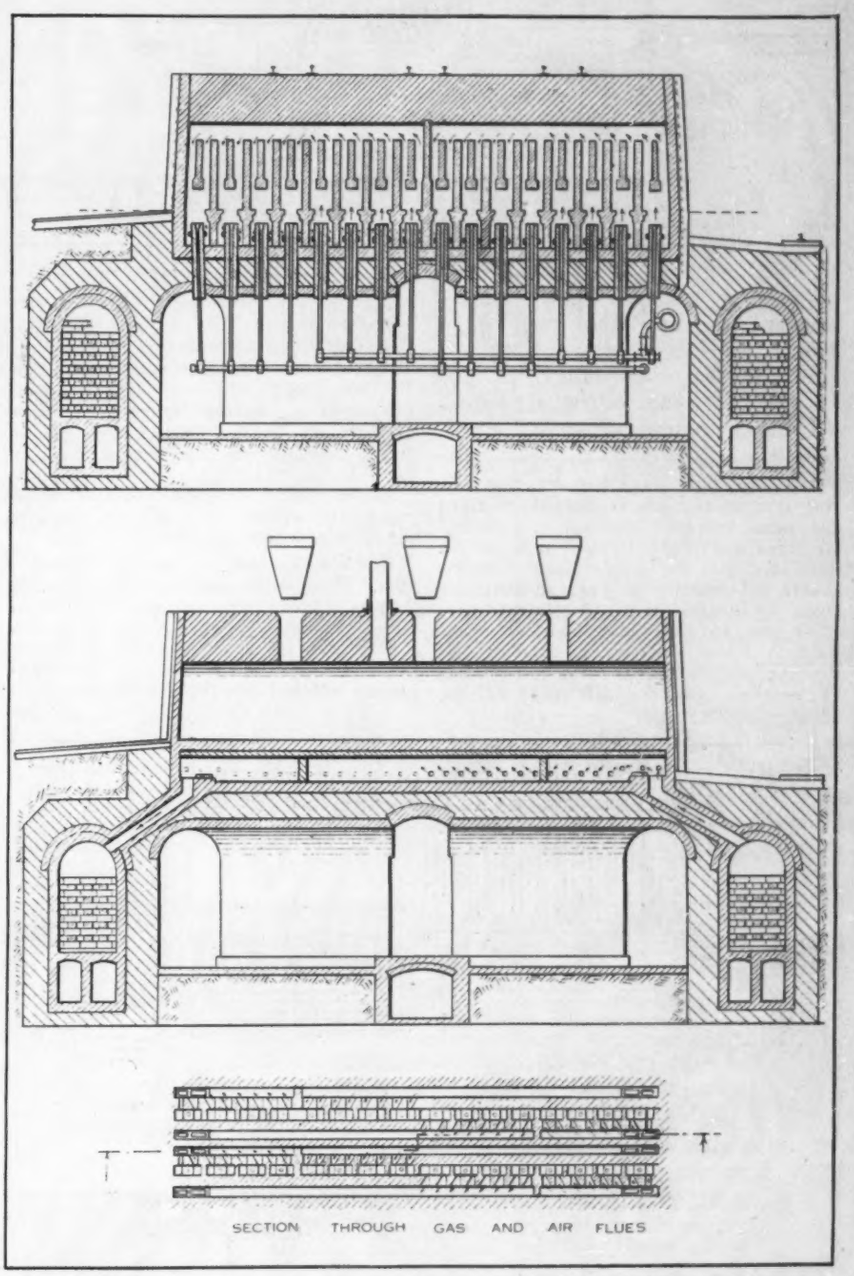
Regulation by a sliding valve is provided for the air supply for each individual oven, and the sliding brick provides individual regulation of the air supply to each vertical flue during the period of combustion. Regenerators in the later Koppers installations are individual for each oven.

In two of the four types of Otto ovens, heating is performed on each half of the oven alternately; the products of combustion passing down the vertical flues of the other half of the oven. In the other two types of Otto ovens the oven is divided into four sections. The products of combustion formed by simultaneously heating, for instance, the first and third sections, pass down the vertical flues of the second and fourth sections, respectively. In each case, reversal is made each half hour.

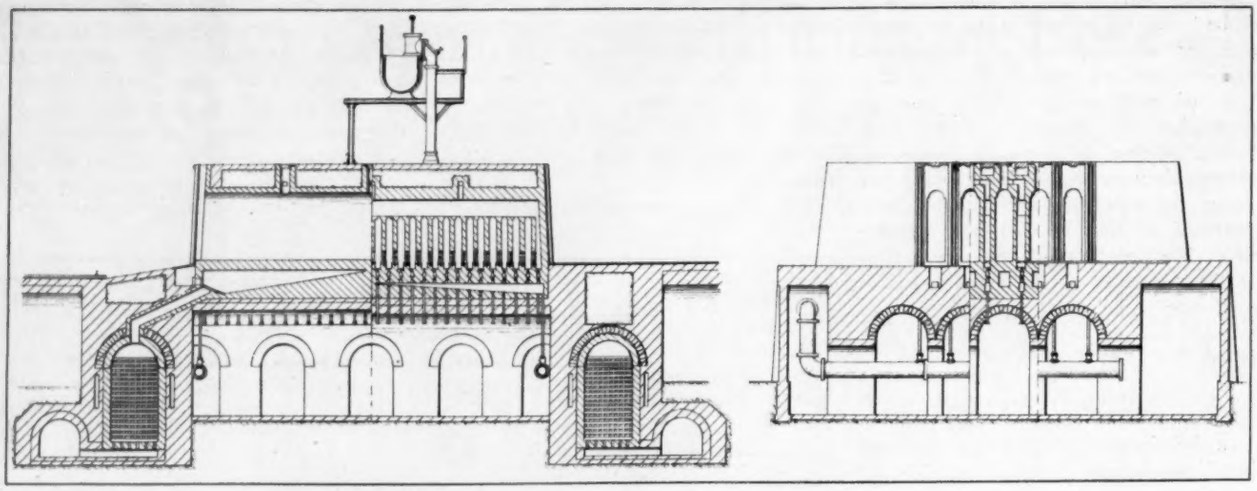
The air for combustion is delivered from the regenerators into an air chamber running beneath the sole of the oven. From this point the air passes through openings in the wall into a combustion chamber which is located below the vertical flues. Here the air meets the gas introduced from the main and combustion takes place. The burning gases travel through the vertical flues, where combustion is completed, and the products of combustion travel down the other vertical flues, through the air chamber into the regenerators and thence to the stack.

Regulation of the amount of air and draught is accomplished by an accessible sliding brick by means of which the size of the opening from the regenerator to the air chamber can be controlled.

In attempting to arrive at uniform heating conditions, several methods have been devised for delivering the gas into the combustion chamber in such a manner as to produce economical and uniform combustion. Three different




OTTO BY-PRODUCT COKE OVEN WITH ONE BURNER FOR EACH TWO VERTICAL FLUES



STILL REGENERATIVE BY-PRODUCT COKE OVEN

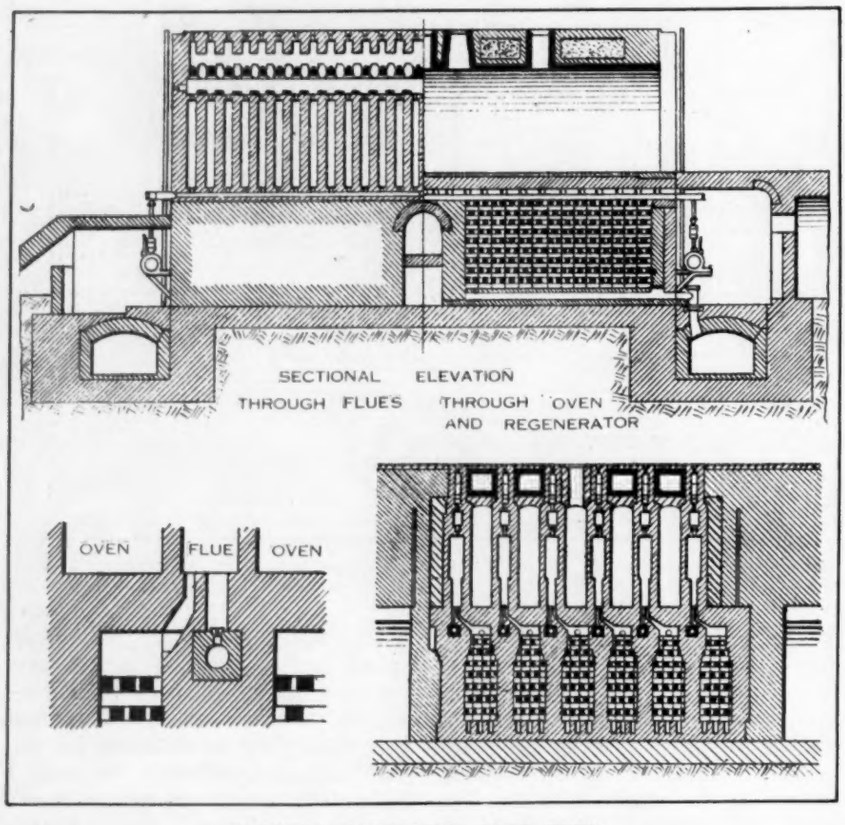
methods now are being followed in Europe, and experiments are being carried on to determine which is the best. In America, another method is followed. These four systems of heating are as follows:

1.—*Three-tier gas burner plan.* In this system, the gas is introduced from the main into the combustion chamber by three gas pipes, located in a tier at each end of the combustion chamber. There are usually 32 vertical flues per oven, 16 in each half. One burner supplies gas for the first four of these vertical flues, the second supplies gas for the second six, and the third burner supplies gas for the rest of the vertical flues in this half of the oven. The combustion chamber is arranged in three sections, each communicating with its own burner.

2.—*One gas burner for each two vertical flues.* In this system the gas is introduced into the combustion chamber in a 32-flue oven, from 16 burner pipes entering the combustion chamber from below the ovens. In this way, one gas entry is provided for each two flues.

3.—*One gas burner for each vertical flue.* This is the latest method but it has not been given an exhaustive trial yet. Theoretically, the results should be better than the other methods described. The products of combustion are withdrawn similarly to the scheme described under head of "One gas burner for each two vertical flues."

4.—*American system of end burner and under-burners.* After using various methods of heating, the American representatives of the Otto type of ovens have practically settled on a system of heating, employing one end burner and two auxiliary or under-burners for each half of the oven. That is, the gas enters the combustion chamber through a burner located at the end of the oven wall, and any further gas supply which may, in the judgment of the heater, be required, is furnished by the two under-burners, which deliver gas into the combustion chamber from the alleyway below. The Otto system of regenerators are of the long type, two being provided, running the entire length of the battery.




KOPPERS BY-PRODUCT COKE OVEN

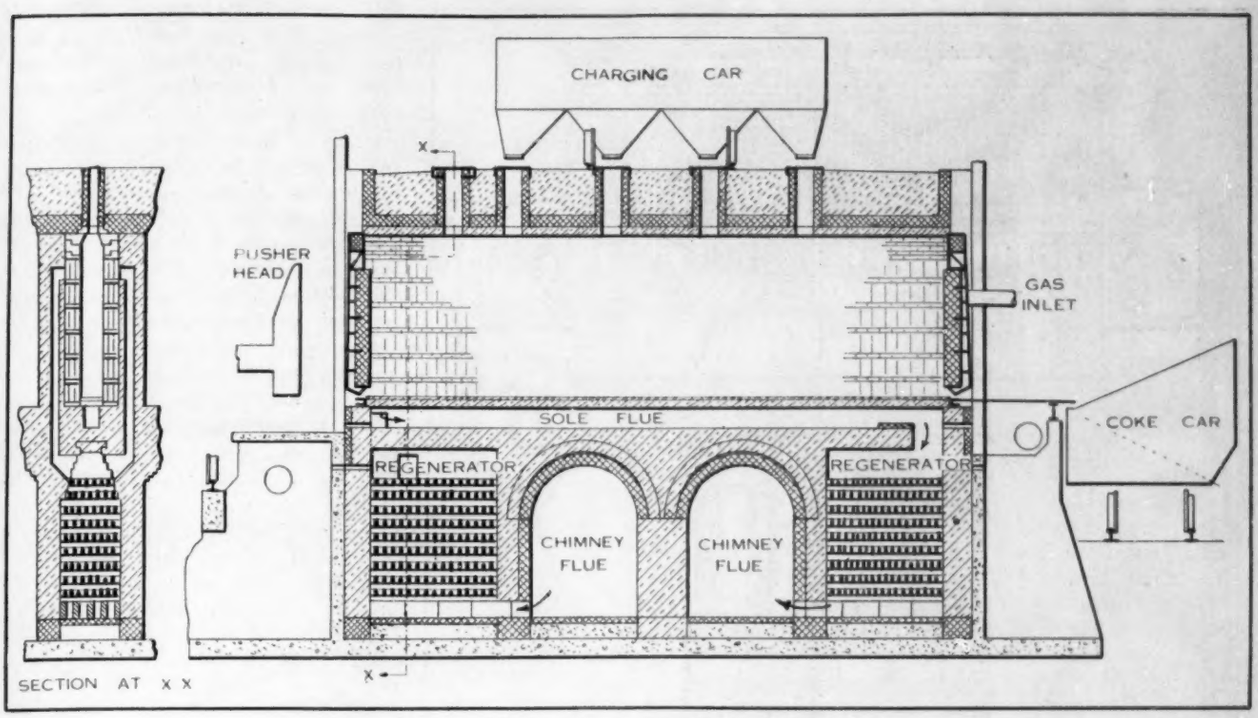
*Collin Coke Oven.*

In the latest type of Collin oven, no reversal from one-half of the oven to the other half occurs, gas for combustion being alternately introduced from the bottom and from the top of the vertical flues, instead of from alternate halves of the oven.

During the first half-hour period, the gas for combustion comes in contact with the regenerated air for combustion, when entering the bottom of each main vertical flue, of which there are 28 per oven. After burning upwards, the products of combustion descend through a second set of 28 flues immediately adjoining and enter into a sole flue.

During the second half-hour period, the gas for combustion enters the top of each of the 28 main vertical flues and comes in contact with the regenerated air, which issues from the top of the 28 smaller flues, through which the products of combustion flowed during the first half-hour period. Combustion occurs downward through the main vertical flues, the products passing into the sole flue.

The products of combustion pass from the sole flue into a series of rec-




SEMET-SOLVAY REGENERATIVE RETORT COKE OVEN

tangular brick passages located beneath the entire battery of ovens, and running at right angles to the oven chambers. This series is divided into two sections, one of which receives the products of combustion for each half-hour's heating. These two sets of fire brick passages lead into two regenerators located between the ovens and the draught stack.

The gas for combustion is introduced by the tier system of end burners, there being four for each end at the bottom of the oven, in the latest systems, and two for each end at the top of the oven.

One of the four bottom burners is reserved for the end or outside flue alone, and the others each supply the gas requirements of four to five vertical flues.

*Coppee Retort Coke Oven*

In the latest type of Coppee regenerative ovens, the side wall is composed of 30 vertical flues, divided into five groups of six flues, each group forming one combustion chamber.

Under each side wall of the oven are four gas distributing flues, two at the front end of the oven and two at the back, and gas for combustion is supplied through these alternately each half-hour; that is, one at the front and one at the back are on gas one-half hour, and the other one at the front and back are on gas the next half-hour, and so on.

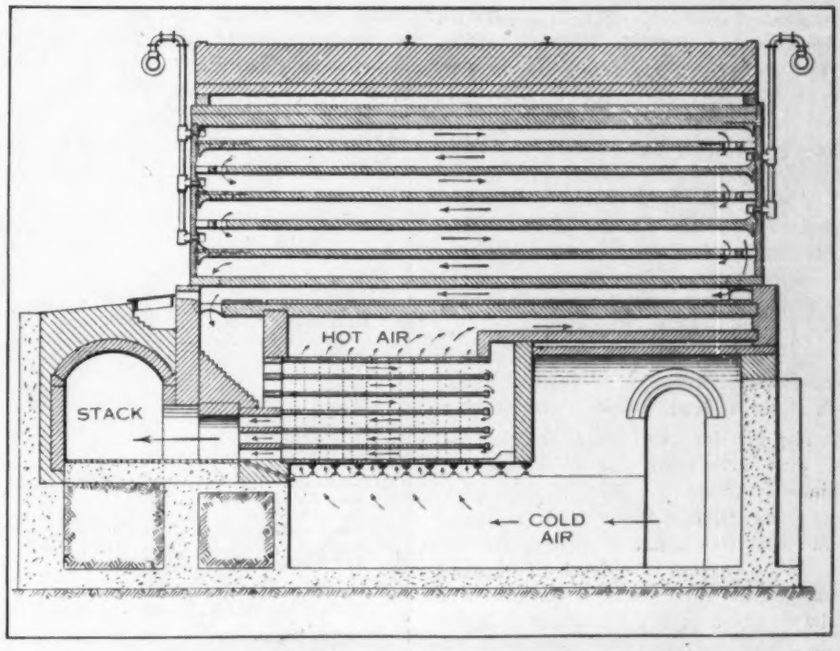
Supposing the vertical flues are numbered from 1 to 30, the first group would comprise flues 1 to 6. During one-half hour gas combustion would be delivered from one front duct to flues 1 to 3, combustion would there occur and the products of combustion pass through flues 4, 5 and 6. Simultaneously, gas would be delivered to flues 7, 8 and 9; 13, 14 and 15; 19, 20 and 21, etc.

During the next half-hour, gas would be delivered from the other front duct to flues 4, 5 and 6, and the products of combustion pass through flues 1, 2 and 3. Simultaneously gas would be delivered to flues 10, 11 and 12; 16, 17 and 18, etc.

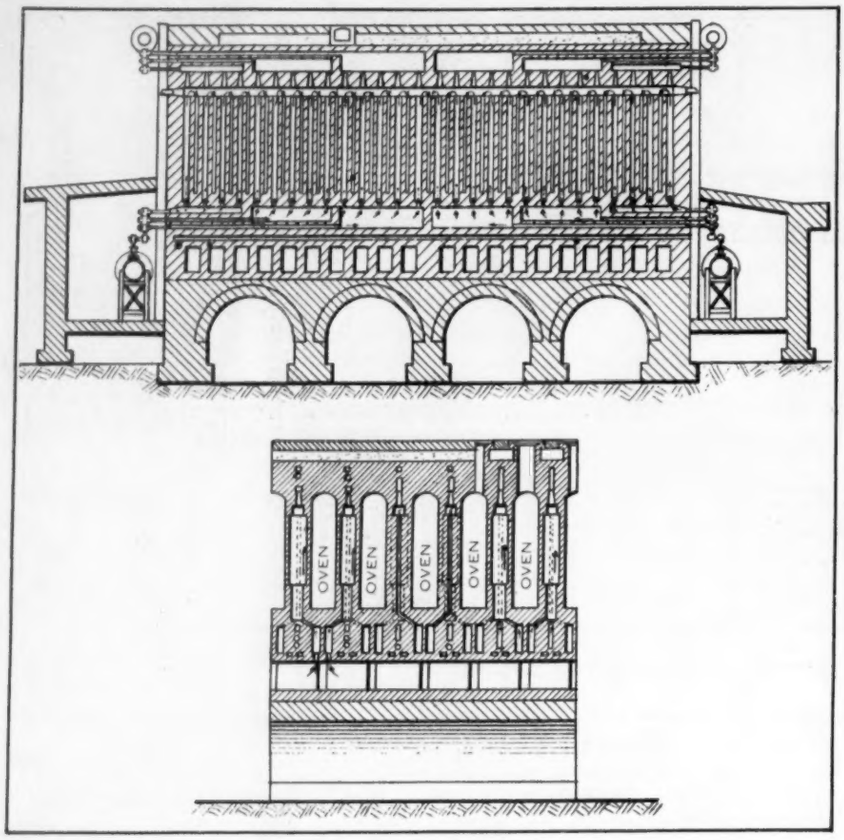
Products of combustion pass into a sole flue, thence into a collecting main running the length of the battery, and thence into the regenerators *en route* to the draught stack.

There are two regenerators running the entire length of the battery, and while one is preheating the air for combustion in one period, the other is being heated by the products of combustion.

The regenerated air for combustion




SEMET-SOLVAY BY-PRODUCT OVEN




COLLIN BY-PRODUCT COKE OVEN

traverses the system in the opposite direction to the travel of the products of combustion, finally passing from the sole flue through oblique openings into the base of the vertical flues where it comes in contact with the gas and combustion occurs.

The Still vertical flue oven is built in two types, off-heat, with no by-product recovery, and regenerative, with by-product recovery. The regenerators are common to all the ovens in a battery and extend the length of the battery on each side. The vertical flues are not accessible from the top. The gas for heating passes from the main into a gas duct beneath the oven, and this gas duct tapers from each end of the oven to the center. The gas passes from this duct through a double nozzle into the vertical flues. The diameter of the opening in the upper gas nozzle is about half the diameter of the opening in the lower nozzle, and there is a vertical space of about 4 inches between the nozzles.

The air for combustion passes from a duct underneath the oven, tapering similarly to the gas duct, through ports into the vertical flue; it is delivered into the vertical flue at two points, one located at about the level of the gas entry, and the other, by means of a slotted brick, at a point about 15 inches above the other entry. The idea of this is to prevent complete combustion low down in the flue, thus preventing an excessive heat at the bottom of the oven.

Table III shows the location and number of ovens installed in this country and Canada, of the three principal types, namely, the Semet-Solvay, Koppers and Otto-Hoffman. This list is not indicative of the capacities of the plants, some being old and the ovens of smaller capacity than the latest installations.

The approximate world's production of coke in 1910 was 110,230,000 tons. The total coal production in Germany in 1911 was 258,223,763 tons. Of this amount, there were used for coking approximately 38,580,500 tons, from which were produced 28,003,911 tons of coke, all in retort ovens.

Of these retort ovens, about 80 per cent were of the by-product recovery type, while 20 per cent were of the non-recovery type. Bee-hive ovens were abandoned in Germany about 20 years ago as being too wasteful and the coke made in them too expensive for their coal conditions.

The total bituminous coal production in the United States in 1911 was 405,757,100 tons, of which 53,278,248 tons were used for manufacturing coke. The coke production in 1911 was 35,551,489 tons, of which 27,703,644 tons were made in bee-hive ovens and 7,847,845 tons were made in by-product ovens; 10,446,584 tons of coal were used to produce the by-product coke and 42,831,664 tons of coal were used to produce the bee-hive coke. From the above, it will be seen that about 22 per cent of the total coke production in this country was from retort ovens as against 100 per cent in Germany.

Germany recovered its by-products in 1911 from 80 per cent of the coke made, while the United States recovered the by-products from only 22 per cent of the coke made.

The United States Steel Corporation in 1912 used a total of 30,306,730 tons of coal. For coking purposes, the Steel Corporation used 24,401,577 tons of coal. It produced a total of 16,719,387 tons of coke, of which 5,164,547 tons were made in by-product ovens and 11,554,840 tons were made in bee-hive ovens; therefore, about 31 per cent of the total coke production was made in by-product ovens. It required 6,624,877 tons of coal to produce the by-product coke and 17,776,700 tons of coal to produce the bee-hive coke.

*(To be continued)*

**Table III.**

BY-PRODUCT COKE PLANTS IN THE UNITED STATES AND CANADA

**Semet-Solvay.**

| Location. | No. of ovens. |
|---|---|
| Syracuse, N. Y. | 40 |
| Dunbar, Pa. | 110 |
| Ensley, Ala. | 240 |
| Benwood, W. Va. | 120 |
| Detroit | 175 |
| Chester, Pa. | 40 |
| Tuscaloosa, Ala. | 60 |
| Milwaukee | 160 |
| Lebanon, Pa. | 90 |
| Geneva, N. Y. | 46 |
| Cleveland | 100 |
| So. Chicago, Ill. | 280 |
| Steelton, Pa. | 120 |
| Waukegan, Ill. | 13 |
| Ashland, Ky. | 54 |
| Indianapolis | 41 |
| Grand total. | 1,689 |

**Koppers.**

| Location. | No. of ovens. |
|---|---|
| Joliet, Ill. | 280 |
| Gary, Ind. | 560 |
| Corey, Ala. | 280 |
| Woodward, Ala. | 60 |
| Joliet, Ill. | 35 |
| Sault Ste. Marie, Ont. | 110 |
| Total in oper. | 1,325 |
| In Construction. | |
| Duluth, Minn. | 92 |
| Woodward, Ala. | 80 |
| Sparrows Pt., Md. | 6 |
| Ind. Harbor, Ind. | 66 |
| Youngstown, O. | 68 |
| St. Louis, Mo. | 56 |
| Total in construc. | 368 |
| Grand total. | 1,693 |

**Otto-Hoffman.**

| Location. | No. of ovens. |
|---|---|
| Johnstown, Pa. | 372 |
| Glassport, Pa. | 120 |
| Everett, Mass. | 400 |
| Sydney, C. B. | 520 |
| Hamilton, O. | 100 |
| Lebanon, Pa. | 232 |
| Buffalo | 188 |
| Camden, N. J. | 150 |
| Sparrows Pt., Md. | 200 |
| Wyandotte, Mich. | 30 |
| Farrell, Pa. | 212 |
| Indianapolis, Ind. | 100 |
| Grand total. | 2,624 |

# THE ABC OF IRON AND STEEL

## The Manufacture of Open-Hearth Steel—V

By Kenneth Seaver

ON THE other hand, the decomposition of $CaCO_3$ into $CaO + CO_2$ involves the expenditure of heat which must come from the furnace, thereby retarding its operations appreciably. There also is a greater tendency to the boiling of the slag and metal as gases escape and great care must be exercised in measuring the amount of ore added to prevent the boiling from becoming too violent. It is the general practice to use raw limestone. Although iron ore and lime as oxidizing agents, to some extent, are interchangeable, the lime must be proportioned so as to keep the slag distinctly basic to supply a base with which phosphorus can combine to form a stable compound. The phosphorus, of course, can unite with the iron oxide as well as with calcium oxide, but with the former the iron again will be reduced and the phosphorus will return to the bath.

### *Iron As An Oxidizer*

While the iron in the basic, as in the acid process, is an oxidizer, there is this difference in making additions by these two methods: It may be added in the basic furnace at the beginning of the operation, as there is no danger of its injuring a basic bottom, while in the acid process, it is added only after the bottom is protected by the molten metal. This, therefore, expedites basic practice. The same principles as to the proportion of the charge, as in acid practice, govern basic, although more pig iron can be used as there are more oxidizing agents and these are at work for a longer time than in the acid furnace. A basic charge may consist entirely of molten iron direct from the blast furnace, as the furnace bottom is protected by the limestone. To keep down the slag the pig should not contain more than 1 per cent silicon, otherwise too much lime is required to combine with the silica. As the phosphorus is well under control, from 90 to 100 per cent can be removed in the slag. Since the sulphur is the most difficult to remove, the pig and scrap should be as low as possible in this element. Sulphur in the pig should run under 0.05 per cent. The limestone should be as pure as possible, as its content of CaO, when calcined, is the measure of the work it will perform, it being evident that whatever proportion of silica may be in the limestone must first be satisfied by its own CaO before the balance of the oxide is available to perform its work of oxidation. The ore is identical with that in acid practice.

### *Open-Hearth Furnace Charge*

A typical 116,000-pound charge for a 50-ton basic open-hearth furnace working an axle steel heat, follows:

| | Per cent. |
|---|---|
| Molten and cast iron, 55,700 pounds | = 48 |
| Steel scrap, 59,620 pounds | = 51.5 |
| Additions: | |
| Ore, 2,000 pounds | = 1.7 |
| Ore (fed) 3,000 pounds | = 2.5 |
| Feldspar, 250 pounds | = 0.1 |
| Lime, 6,800 pounds | = 5.8 |
| Calcined dolomite, 1,800 pounds | = 1.4 |
| Rods, 130 pounds | = 0.1 |
| Additions in ladle: | |
| Coal, 281 pounds. | |
| Ferro, 500 pounds. | |

### *Methods of Charging*

While the methods of charging a basic open-hearth furnace vary, it is the customary practice to charge all or nearly all of the limestone first, followed by the pig and then the scrap. To keep the slag strictly basic, the limestone may be charged in small proportions during the heat and the order of charging the pig and scrap also may be reversed.

The exact period at which phosphorus is eliminated is difficult to determine, as this is dependent in a great measure on the particular practice followed. The accompanying table from Campbell shows the elimination after melting in this particular series.

A low phosphorus content practically may be eliminated during melting. It is important that the phosphorus be removed before the carbon is down. With the carbon practically all oxidized, there is great difficulty in removing the last traces of phosphorus. In such cases, it may be necessary to pig-back to again get the metal on the boil, adding fresh limestone.

The slag must be kept highly basic with

limestone to provide ample lime with which the phosphoric acid may unite. If the slag becomes too weak in this base at any time, the phosphorus has a tendency to return to the bath. The slag may have insufficient lime even if an ample quantity has been charged, due to its tendency to become viscid under heat and to stick on the bottom. When the heat is melted, the bottom must be thoroughly rabbled to insure that all the lime is up. This is necessary not only because the presence of the lime is required for the chemical reaction, but because otherwise the bottom will build-up, thereby reducing the capacity of the furnace.

A sample taken after charge is melted will show whether the elimination of phosphorus and carbon is satisfactory. Too high phosphorus often will show in the fracture in a crystalline form termed the *phosphorus cross.* With the usual stock, however, and a fairly low phosphorus metal, this element will be eliminated when the carbon is sufficiently oxidized.

No element is so irregular in its elimination as sulphur. In some mills it is the practice to allow no higher average percentage of sulphur in the stock than is allowable in the ingot. In other plants, however, from 20 to 30 per cent of the sulphur content is removed, while by the employment of special processes, as high as 50 to 75 per cent of the sulphur may be removed. With the metallic manganese, the sulphur forms a sulphide, MnS, which has a tendency to separate from the bath, a portion being absorbed by the slag and a part may be decomposed by the heat when the sulphur burns and the manganese returns to the bath. Manganese ore, preferably added to the charge, is reduced to metallic manganese, its action in the removal of sulphur being as already indicated. The following reactions are involved:

$$Mn + FeS = MnS + Fe$$
$$MnS + 2O = SO_2 + Mn$$

As indicated in the above, the portion of sulphur removed in the slag is in the form of a sulphide. The amount depends on the excess of lime, as well as the temperature, a hot-working furnace and a fluid slag always being an aid. If the furnace works sluggishly, the elimination is less and more erratic. It involves the following reactions:

$$S + CaO + C = CaS + CO$$
$$MnS + CaO = CaS + MnO$$

**Phosphorus and Carbon Elimination**

| Pounds of ore charged with stock per ton of metal. | No. of heats in group. | Composition of metal per cent — Phosphorus — Initial. | Phosphorus — After melting. | Phosphorus — Per cent eliminated. | Carbon — Initial. | Carbon — After melting. | Carbon — Per cent eliminated. | Composition of slag after melting per cent $SiO_2$ | Composition of slag after melting per cent FeO |
|---|---|---|---|---|---|---|---|---|---|
| None | 17 | 0.20 | 0.046 | 77 | 2.00 | 0.71 | 65 | 19.21 | 13.68 |
| None | 4 | 1.36 | 0.594 | 57 | 1.50 | 0.60 | 60 | 14.90 | |
| None | 9 | 0.19 | 0.023 | 88 | 1.80 | 0.27 | 85 | 15.55 | 19.68 |
| None | 9 | 0.19 | 0.072 | 62 | 1.80 | 0.78 | 57 | 19.98 | 12.20 |
| 300 | 3 | 2.50 | 0.744 | 70 | 3.50 | 0.59 | 83 | 11.96 | 8.61 |
| 115 | 6 | 0.55 | 0.274 | 50 | 2.90 | 1.00 | 66 | 30.73 | 10.71 |
| 140 | 7 | 0.55 | 0.402 | 27 | 2.90 | 1.48 | 49 | 34.22 | 10.95 |

*Saniter Process*

By the Saniter process, that is, by the employment of oxychloride of lime, an exceedingly basic slag is carried previous to the introduction of the oxychloride, in fact, the slag is so basic that it contains 50 to 60 per cent of lime and it is claimed that this excess basicity with the marked fluidity, due to the oxychloride of lime, enables the slag to absorb a large amount of sulphur. In the basic process, the slag requires more careful attention than in the acid furnace. Not only is its volume much greater, but contrary to acid practice, one of its impurities already oxidized may return to the bath unless the slag has proper attention. Its composition includes silica from the oxidation of the silica in the pig, and any present as impurities in the limestone, ore, etc., oxides of calcium, iron and manganese, the latter from the pig and also from the manganese ore sometimes added. It contains also alumina from the impurities in the lime or dolomite, as well as magnesia taken up from the bottom, with any phosphorus that may have been oxidized and held as phosphoric acid and subsequently as phosphate of lime, together with a variable amount of sulphur in the form of calcium sulphide.

Two primary essentials in basic slag are basicity and fluidity. On the basicity depends the power of the slag to take up and hold sulphur and phosphorus. Unless sufficiently basic, it will cut the bottom rapidly. It must be fluid to properly work the heat, to pour cleanly from the bottom that the latter may not fill up, and last, but by no means least, upon its fluidity, as well as its basicity, depends in a large measure its ability to remove the phosphorus and sulphur. Such oxides of iron manganese as are present have a tendency to render the slag more fluid, while magnesia increases the basicity. If too thick, the slag may be thinned by the addition of small amounts of calcium fluorspar. This increases the fluidity without lowering the basicity. Manganese ore also sometimes is used with the additional advantage that it is a de-sulphurizing agent.

The presence of oxide of iron in the slag, as there is an excess of calcium oxide to satisfy the silica, requires explanation. The theory advanced by Campbell is that slags have a tendency to combine with whatever will promote their fluidity. A slag consisting almost

entirely of silicate of lime is viscous and, consequently, seizes upon the iron, thereby conferring fluidity. Without going into detail, it is Campbell's conclusion that the regulation of the percentage of $SiO_2$ + FeO in the slag is practically automatic.

The following analysis shows a typical basic slag from a normal axle steel heat, the charge consisting of 47 per cent molten or cast iron and 51 per cent of steel scrap:

| | |
|---|---|
| $SiO_2$ | 10.80 |
| FeO | 22.01 |
| $Al_2O_3$ | 1.55 |
| $P_2O_5$ | 5.61 |
| MnO | 9.00 |
| CaO | 44.00 |
| Mgo | 6.53 |

*Removal of the Slag*

When the ore is charged, the oxidizing action is considerable, as the slag in the earlier stages often contains large percentages of phosphoric acid. Owing to the foaming of the large volume of slag, which occurs when the ore and limestone are used, and the liability of phosphoric acid, once in the slag, to return to the metal, the removal of the slag, either partial or entire, often has been suggested. In an ordinary furnace this is difficult of accomplishment without wasting metal, as the slag line varies and if tapped low enough to get all of the slag, a small portion of the metal is often tapped with it. This, however, is done regularly at some plants, particularly where tilting furnaces are employed.

Recarburization in the basic furnace is practically identical with that of acid practice. It is not uncommon to have in the decarburized metal in the basic furnace, a considerable content of manganese, either from manganese ore introduced to promote fluidity and the removal of sulphur, or from the stock, and due account of this must be taken in the ferro addition. Carbon must be added in the ladle, for if the heat is to recarburize in the furnace in contact with the slag, a portion of the phosphorus may return to the slag.

*Special Processes*

In what is often termed the continuous open-hearth process, patented by Talbot in 1899, a modified open-hearth furnace of large capacity is used, often holding over 200 tons of metal. The initial charge of scrap and pig is worked as usual and when ready to tap, 25 to 30 per cent of the metal is withdrawn. To the remaining metal is added oxide of iron in the form of roll scale, mill cinder or iron ore. After this is melted, hot metal and limestone, equalling in amount that already tapped, are added.

The slag, now rich in oxides of iron, causes violent reactions and purification is quickly effected, the percentage of impurities of the hot metal added being considerably reduced by dilution with the purified metal in the furnace. The additions are made at intervals, dependent upon the particular practice and the violence of the reactions. This procedure is repeated as often as the metal is sufficiently purified. At the end of the week it is customary to tap the entire charge to permit of making necessary repairs. The essential principle involved is the exceptionally vigorous reactions brought about upon the hot metal by the slags which are abnormally high in metallic oxides and, consequently, are readily reducible by the metalloids of the bath. This method is applicable to the pig and ore process. It permits of a considerable variation in the analysis of the metal used and produces a large tonnage.

The Monell process is essentially that of Talbot, as it depends upon the strong oxidizing action of a slag rich in oxides of iron. It is carried out in the usual stationary furnace, limestone and iron oxides being charged first, which are heated until almost melted, when the molten pig is charged. After purification, the entire heat is tapped. The heavy and corrosive slag comes more in cantact with the furnace bottom than in the Talbot process and this necessitates careful attention to bottom repairs.

*Bertrand-Thiel Process*

The Bertrand-Thiel process has been developed abroad and is especially adapted to the use of high phosphorus pig iron. Two furnaces of the ordinary type are employed. Into the first is charged molten pig, or pig and scrap, ore and limestone, as in ordinary practice. The ensuing reaction removes all of the silicon, most of the phosphorus and a portion of the carbon. The metal then is tapped into the second furnace in which is an additional charge of lime and ore, usually together with a certain amount of scrap, all being heated to fusion and care is exercised to prevent the addition of slag from the first furnace. In the second furnace the purification of the metal is completed. In this process the highly oxidizing action of a slag rich in oxides of iron is again made available, together with the removal of the first slag holding the major portion of the phosphorus, thus eliminating any chances of its return.

The duplex process is merely a combination of the Bessemer and open-hearth and is particularly applicable to the use of pig iron containing too high a percentage of silicon for its advantageous working in either the basic Bessemer or basic open-hearth processes. In the acid Bessemer converter, the preliminary treatment removes the silicon, considerable manganese and a certain amount of carbon. The desiliconized metal then is transferred to the basic open-hearth, where the phosphorus and remaining carbon are eliminated as usual. This process is employed mainly in the south, where the iron produced is adapted to this treatment.

# Malleable Iron Castings for Autombile Work[1]

*A Discussion of the Thickness of Section That Can Be Annealed, the Limit of Silicon Content and the Strength and Adaptability of Malleables*

By Enrique Touceda

Although malleable iron, as compared with steel, enters into automobile construction to a limited extent only, the actual amount used in the industry is large. I believe it will be admitted, as a general proposition, that the constructing engineer, while thoroughly posted on carbon and alloy steels, knows less about this material than possibly any other passing through his hands.

There is a widely prevalent misconception that when any part of a malleable casting exceeds 3/8 inch in thickness of section, the change that normally takes place during the annealing process, whereby the hard and brittle white iron castings that come from the air furnace are converted into soft, tough and ductile ones, is but imperfectly accomplished.

The malleable iron process is conducted in two steps, the first of which consists of melting gray pig iron upon the hearth of an air furnace, when a certain amount of the original silicon, carbon and manganese is oxidized, and thus removed from the iron while it is being melted and subsequently raised high enough in temperature to successfully run the castings. The following three facts are well known to those who possess even an elementary knowledge of the metallurgy of iron and steel:

First most of the carbon content of gray pig iron exists in the form of graphite, that is, free; if a pig be broken and the fractured end be gone over with a stiff brush, it is easy to thus remove the exposed little flakes of graphite held in mechanical mixture with the iron and always separated from the iron during and for an interval after solidification.

Second, when pig iron is uniformly white in fracture, no graphite is apparent upon inspection; instead of the carbon separating out in whole or in part as graphite, it is all combined with the iron *chemically.*

Third, a pig iron having most of its carbon in the form of graphite, can be changed into an iron in which none of its carbon will separate out as graphite if this pig iron be melted in such a manner that a certain amount of its silicon content be removed from it through oxidation;

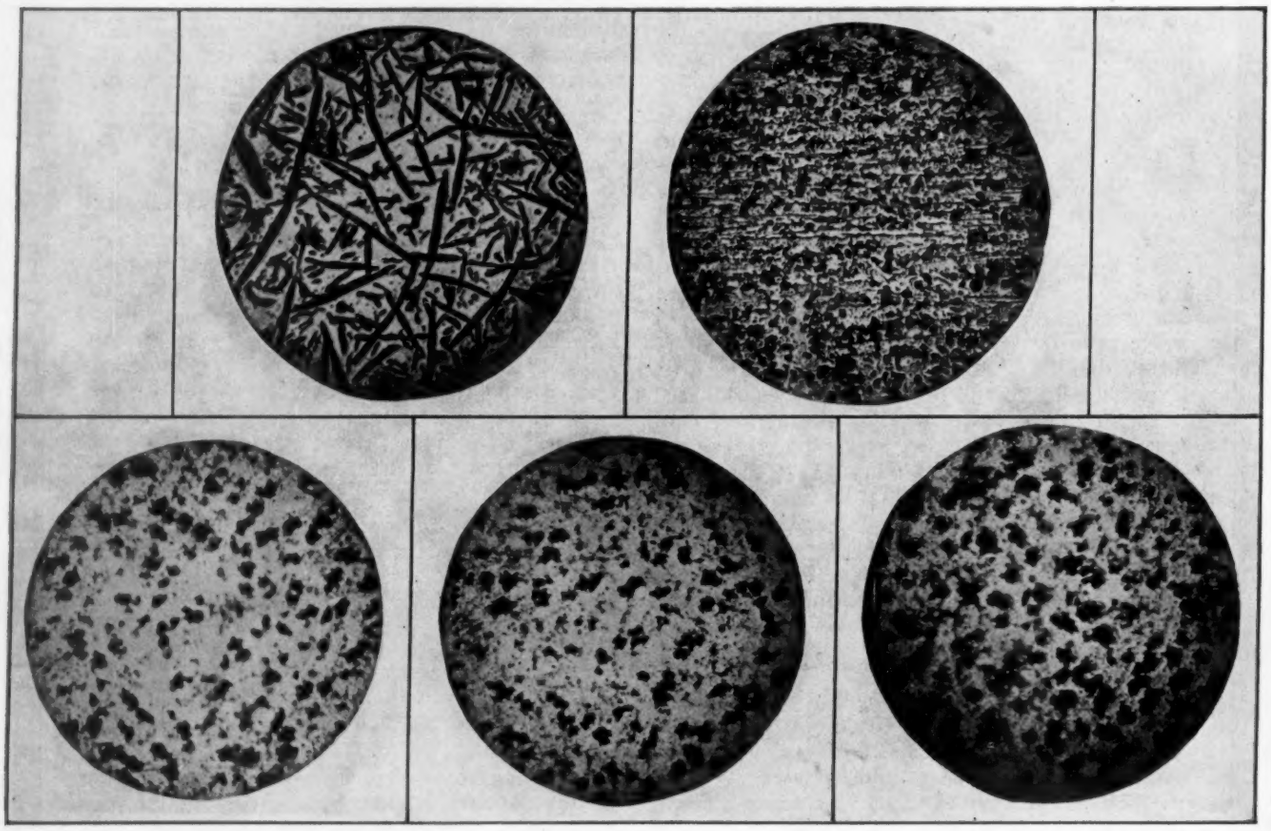


FIG. 1—PHOTOMICROGRAPH OF POLISHED, UNETCHED SECTION GRAY PIG IRON

FIG. 2—PHOTOMICROGRAPH OF POLISHED SECTION OF WHITE IRON

FIG. 3 — PHOTOMICROGRAPH ANNEALED MALLEABLE, 1/4 INCH FROM SURFACE

FIG. 4 — PHOTOMICROGRAPH ANNEALED MALLEABLE BETWEEN SURFACE AND CENTER

FIG. 5 — PHOTOMICROGRAPH ANNEALED MALLEABLE AT CENTER OF BAR

[1]Presented at the summer meeting of the Society of Automobile Engineers.

for if the silicon content is in excess of a certain amount, it prevents the carbon from combining chemically with the iron, while if it be removed gradually from a pig iron in which the carbon would normally have existed as graphite, a point will finally be reached at which its influence in forcing the carbon to separate out as graphite will cease.

*Removal of Silicon*

It is an easy matter then to start with pig iron that is gray in fracture and in which all or most of the carbon exists as plates of free graphite, and end with an iron that is white in fracture and in which all of the carbon is combined chemically with the iron; it is a question solely of getting rid, in the air furnace, of such an amount of silicon as will accomplish this end. It thus becomes obvious that the manufacturer of malleable iron castings, by means of his air furnace, experiences no difficulty whatever in converting gray pig iron into white cast iron; which operation constitutes essentially the first step of the process. Many years ago it was discovered that if hard, brittle white iron were surrounded tightly by an oxidizing packing, such as iron oxide in any form, and then raised to and maintained at a temperature of about 1,500 degrees Fahr. for a few days, it would not only be changed into very soft and ductile iron, but some of its carbon would be removed during the interval. This constitutes the second step in the malleable iron process. Consequently, the first step toward getting soft and ductile castings in the malleable iron process, is to first get hard and ductile brittle castings, in which all of the carbon is combined chemically with the iron as carbide of iron, the hardest constituent in either iron or steel. The second step is to break up this hard constituent into carbonless iron and free carbon, both of which are soft. By the aid of photomicrographs, what takes place during the second step of the process, that is, in the annealing ovens where the white and brittle castings are placed to be converted by time and temperature into finished castings, will be explained in a non-technical manner.

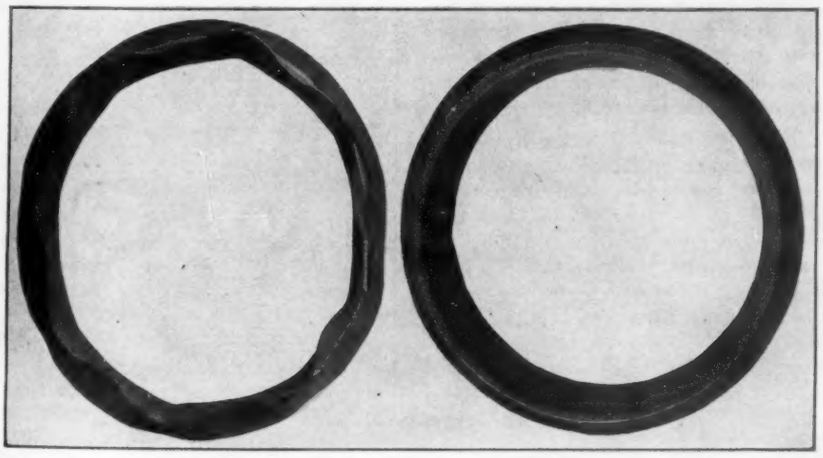


FIG 6—MALLEABLE, AUTOMOBILE CLUTCH RING MACHINED FROM 7-16 TO ⅜ INCH, SUBJECTED TO HEAVY BLOWS TO TEST DUCTILITY AND STRENGTH OF CORE

*Photomicrographs*

Fig. 1 illustrates a polished, unetched section of a piece of gray pig iron, the object of which is to show the plates or flakes of graphite that separate from the metallic iron, when the silicon is sufficiently high in the iron to force the carbon thus to separate. It will be noted that there is practically no regularity of either size or distribution of these flakes; therefore it is not to be wondered at that cast iron test bars show great irregularity in strength, even when poured from the same ladle of iron.

Fig. 2 shows a polished section of white iron, white because its silicon content was too low to force any of its carbon to separate out as graphite. The whole of the carbon consequently remains chemically combined with the metallic iron, invariably in the proportion of 6.67 per cent carbon to 93.33 per cent iron. The extremely hard carbide of iron is shown mostly in the white areas, but about 12 per cent of the dark areas consists of this hard constituent also, the reason for which it is not necessary to consider for the purpose of this article.

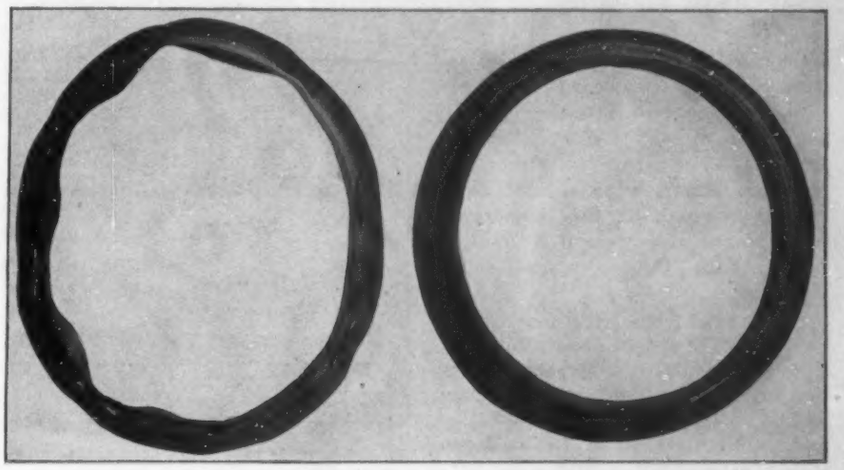


FIG. 7—ANOTHER VIEW OF MALLEABLE CLUTCH RING MACHINED AND TESTED AS FIG. 6

As previously stated, carbide of iron is the hardest constituent that can exist in either pig iron or steel, but fortunately, as already indicated, it has been discovered that if it be heated to about 1,500 degrees Fahr., for many hours, it can be split into little nodules of free carbon and a mass of practically pure iron, the former being very soft and having no strength, and the latter being both soft and ductile and possessing high strength. An inspection of the polished sections of annealed malleable iron, Figs. 3, 4 and 5, will show that these little nodules of free carbon (the little black areas in the photomicrographs) are uniformly distributed throughout the entire section and are uniform in size, differing in both particulars from the manner in which the graphite occurs in gray iron.

To contend that white iron castings over ⅜ inch in section cannot be annealed as efficiently as castings of less thickness, is to contend that a piece of white iron over ⅜ inch in section cannot be heated uniformly throughout its entire section to a temperature of 1,500 degrees Fahr. or over. This is manifestly absurd, for it must be

admitted that in many different processes ponderous pieces of steel are being heated daily throughout their mass to any required temperature. The sole precaution in any case is to see that plenty of time be given the operation. As it happens that in the annealing process in the manufacture of malleable iron castings, some seven days are consumed from the time the castings enter the ovens until they are withdrawn, if the breaking up of the hard carbide is not complete in the case of thick sections, this is certainly not due to lack of time to allow the piece to heat uniformly throughout. Moreover, there is no trouble whatever in maintaining the temperature of the ovens at any point under 1,900 degrees Fahr.

*Thickness of Section*

The direct question can now be put: What is the limit of thickness of section beyond which white iron will not be efficiently and completely annealed, that is, not have all of the hard constituent completely replaced by little nodules of free carbon and practically pure iron? The answer is plain. Any thickness of white iron can be thoroughly and uniformly annealed throughout its section, that is not so thick that it cannot be heated uniformly throughout, and in which the

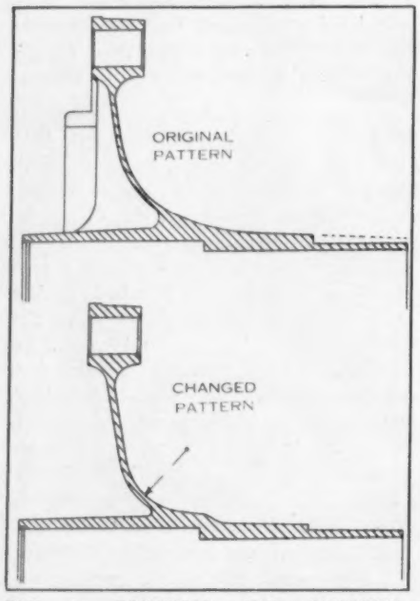



FIG. 8 — ORIGINAL AND CHANGED PATTERN FOR MALLEABLE CASTING

whole of its carbon content exists as carbide of iron. It has been shown that whether the carbon exists as *carbide* or as *graphite*, it is simply a matter of how *low* or how *high* the silicon may be in the casting. It has also been shown that the adjustment of the silicon is under the complete control of the manufacturer. If the silicon is as low as 0.30 per cent, it is possible to obtain easily, sections as thick as 6 inches, in which all of the carbon will exist as carbide of iron, although in this extreme case, to break up all of the carbide and completely replace it with free carbon and iron, a higher temperature than that normally used during the

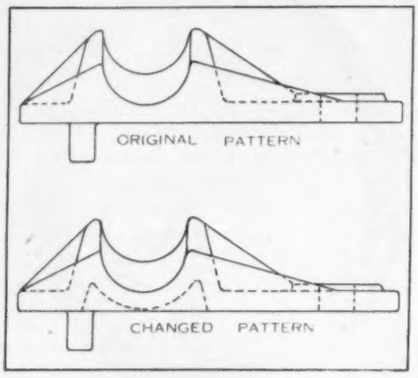



FIG. 9—ORIGINAL AND CHANGED PATTERN WHICH REDUCED AMOUNT OF METAL IN THE CASTING

anneal is required. In sections 3 inches thick, all the carbon will exist as carbide of iron when the silicon is around 0.50 per cent, in which event neither a higher temperature nor a longer anneal than is customary in ordinary practice will be required. I have therefore placed this as the limit of thickness for efficient and complete annealing. The trade, however, does not call for malleable iron in which the sections are this heavy. The statement can be made that if the process is fully understood by the manufacturer, and he will adjust the silicon content in accordance with the heaviness of the work, no trouble from this source should exist, and none ever will.

Referring again to Figs. 3, 4 and 5, these photomicrographs were taken from an annealed malleable section 2 inches in diameter and several inches in length. The sample was cast at my request from a heat in the regular course of work. While the company makes fairly heavy castings, none of the parts approaches this sample in thickness. Still, as will be seen, the silicon in this company's white iron was low enough to cause all of the carbon to form carbide of iron in a 2-inch round. This sample was annealed in the oven with the company's other castings, in exact accordance with the regular practice of the shop. Fig. 3 was photographed at a spot about ⅛ inch from the surface; Fig. 4, at a spot midway between the surface and the center; and Fig. 5 directly at the center. A close inspection and comparison of these three photographs should satisfy the most skeptical that this piece was annealed throughout, and that all of the hard carbide was broken up into free carbon and soft iron. Accompanying this sample was another, 4 inches in diameter, the central part of which I found contained considerable graphite in the form of flakes, which from their shape could be identified as having resulted from the separation of some of the carbon during the solidification of the white iron, showing that in this case the silicon in the normal mixture was not sufficiently low to have forced all of the carbon to combine with the iron, although had the silicon been somewhat lower, no difficulty in this particular would have been experienced.

*Removing Skin*

In connection with the oft-repeated statement that if the skin of a malleable casting be removed, and the core tested, the latter will be found to be more or less worthless and that malleable castings are strong and ductile by virtue principally of the metal in the skin, I wish to state that there is no question whatever that the metal

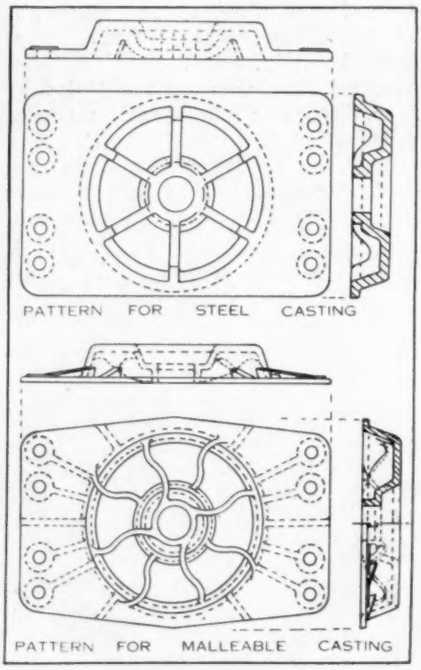



FIG. 10 — PATTERN FOR MALLEABLE CASTING AND HOW IT WAS CHANGED WHEN MADE OF CAST STEEL

in the skin of well-made malleable iron is slightly superior to that which constitutes the main bulk of the casting, but only in the case of poor malleable iron can a really great differ-

ence in strength between skin and core be noted; the poorer the malleable the more pronounced this difference. Malleable castings are not unique in this particular, for the metal in the skin of most steel castings is stronger than the central part of the casting, although not for the same reason that obtains in the case of malleable iron. The skin of malleable castings is practically decarbonized iron, the structure being uninterrupted by the presence of any little nodules of free carbon. The structure of the core, however, differs from that of the skin, only in that throughout it little nodules of free carbon are interspersed. That in good malleable iron these little particles of free carbon do not act in a way to injure the structure to any appreciable extent, I have satisfied myself by numerous tests from time to time. To illustrate this fact, I have secured two castings of an automobile clutch ring, shown in Figs. 6 and 7. The 7/16 inch thick rim of the casting was machined down to a thickness of ⅛ inch, after which it was subjected to repeated heavy blows with a hammer to test the ductility and strength of the core left after machining. It will be seen that the metal of the core, in this instance, was of great strength and ductility, was able to withstand great punishment without developing cracks of any magnitude. It is most likely true that the metal in the skin of this casting was slightly superior to that in the core, but I feel confident that the difference was not great, and I repeat that in good malleable castings, while the metal in the skin is a little superior to that of the core, the difference is but slight. The photographs referred to speak for themselves. Some manufacturers of malleable iron have not kept pace with the advances made in malleable practice; some do not even understand the rationale of the process, or lack good manufacturing equipment, and while, fortunately, these do not predominate, there are enough of them in existence to throw much undeserved discredit on one of our large, important and growing industries. I am convinced, however, that the constructing engineer has, owing to improperly designed patterns, contributed unintentionally in numerous instances, to this situation. The worst offenders in this particular, however, are the engineers for the railway car builders.

If the question of shrinkage and contraction be not properly considered, if the apportioning of thick to thin sections be not adjusted in accordance with correct principles, no matter how superior may be the metal *per se*, failure is the certain outcome. The remedy should be obvious. Practically all of the makers of malleable castings have on their staff, men who are proficient in the design of patterns from which to cast malleable. Much delay, much irritation, and a great deal of injustice

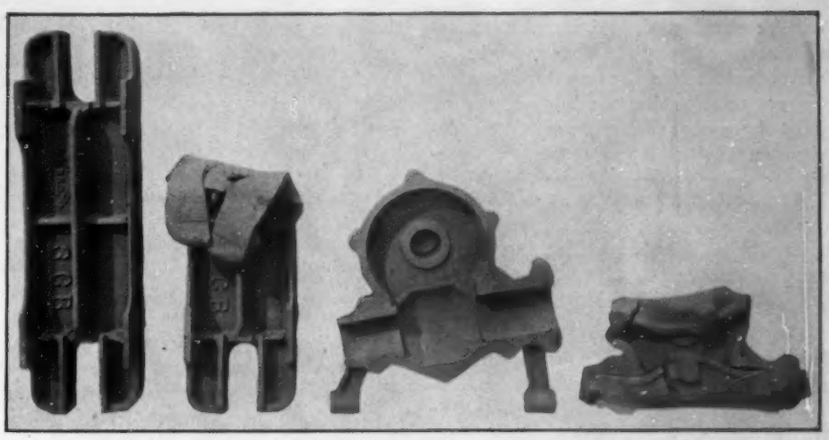


FIG. 12—MALLEABLE CASTINGS BEFORE AND AFTER HAMMERING

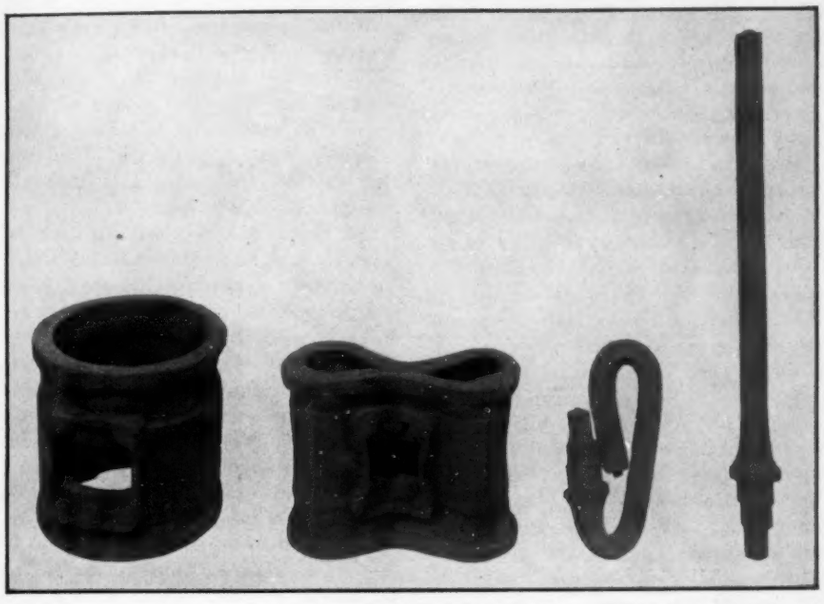


FIG. 11—MALLEABLE CASTINGS BEFORE AND AFTER BEING SUBJECTED TO HAMMERING AND BENDING TESTS

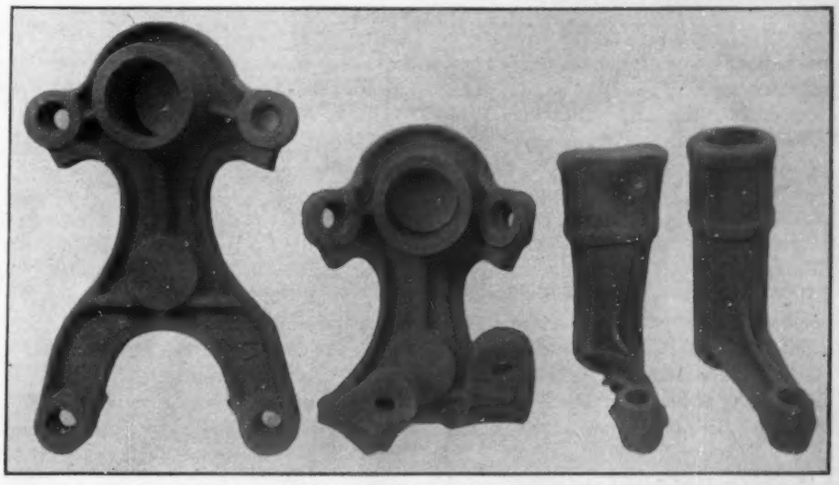


FIG. 13—MALLEABLE CASTINGS BEFORE AND AFTER HAMMERING, BENDING AND TWISTING TESTS

will be eliminated, and a much stronger casting for the same weight of metal will often be produced, when closer relationship and co-operation exist between the engineer who designs a malleable part for any particular machine and the malleable patternmaker at the foundry. Lack of time has prevented my securing more glowing examples than the ones here shown, of how small need be the alteration in a pattern, in many instances, to produce good results where bad ones previously obtained. The changes shown in Fig. 8, although very slight indeed, made the difference between success and failure. The same remark holds good in the case of Fig. 9, the change producing not only a satisfactory casting but one containing less metal. In connection with the center plate shown in Fig. 10, the following are the facts: Complaint was made by the railroad that these malleable castings were failing in service. The manufacturer of the castings made the request that he be permitted to alter the patterns in accordance with what his experience indicated would remedy the trouble. This privilege was not granted. The road then decided that malleable iron castings could not be depended upon in this particular case; so it was decided to have the castings made of steel. The steel men also objected to the design of the pattern, and, as almost always happens when a change is made from malleable iron to steel, they were allowed not only the privilege denied the others, but, as can be seen by reference to the drawing, they were permitted to thicken the sections by ¼ inch almost throughout. That changes were made in both design and weight is soon forgotten, but not that the steel casting stood up to the work and the malleable casting failed.

*Physical Properties*

In Figs, 11, 12 and 13 are shown malleable castings which have been hammered, bent and twisted. They eloquently illustrate the fact that when malleable castings are made by those who understand the process, castings that possess many valuable characteristics are produced. When toughness and ductility, ease of machining and low cost are considered, I do not know what metal can compete successfully with good malleable iron.

The tensile strength of good malleable iron will vary between about 38,000 to 56,000 pounds per square inch. When extreme ductility is desired, it is manifestly incompatible to specify high tensile strength. As in the case with carbon steel, so with malleable iron, ductility goes hand in hand with low ultimate strength; if high ultimate strength is desired, it can be obtained only by a sacrifice of ductility.

*Elastic Limit of Malleable Iron*

The elastic limit of good or of even indifferent malleable iron is equal to that of wrought iron and frequently exceeds it. When comparisons are made between this material and other metals, it would be more fair to consider the elastic limit rather than the ultimate strength, for it is the former upon which the engineer actually bases his calculations. The elongation and reduction of area of malleable are, of course, considerably less than of either wrought iron or soft steel. That both of these properties are high enough to impart great value to malleable castings is impressively attested by the illustrations of the abused castings previously referred to.

It is the custom in plants of fair size to run various furnaces on mixtures for different classes of work. The mixture from one furnace is not as well adapted to one class of casting as to some other. If the user of the castings will only take the manufacturer into his confidence and explain the use to which any particular casting is to be put, and the work expected of it in service, I know that loss of time will be avoided, and a more superior product manufactured. Some consumers are under the false impression that for competitive reasons they should lighten their castings. This generally necessitates the introduction of more cores in the mold, the result being that the manufacturer is obliged to charge more per pound.

I presume that specification is of more interest to the membership than perhaps any other one question in connection with this material. I have no desire to usurp the duties of the committee having this matter in hand, the work of which in all that has been done has been so commendable, but a few words in connection with the Society of Automobile Engineers malleable iron specification will I trust be taken in the spirit in which they are intended. I believe that a mistake has been made in specifying an upper limit for silicon. As a matter of fact, it is well known that the higher the silicon in the white iron casting, provided the totality of the carbon in the casting exists in the state of carbide of iron, and all other conditions are correct, the better will be the finished product. I have shown that the manufacturer is obliged to eliminate his silicon to a point where all of the carbon will remain as carbide, and also that the extent to which he must carry out this elimination depends wholly upon the heaviness of the section. It is exceedingly rare that he errs in getting the silicon too high, because he does not need a chemical analysis to safeguard this, as all that he has to do is to keep breaking his test sprue until he sees by the fracture that the iron is white, and that there are no particles of graphitic carbon in the fracture. He is more concerned in this particular than the purchaser can ever be, and to this extent the purchaser is protected. To specify an upper limit for silicon is about as necessary as to specify that the manufacturer shall pour his iron in the molds at a temperature sufficiently high to successfully run his castings. You can rest assured that he is going to look after the upper limit of silicon with as much fidelity as he will be sure that the iron is hot enough to avoid trouble through misruns.

On the other hand, it would be wise to specify a limit beyond which the silicon shall not drop, because not only does the manufacturer err frequently in this direction in the making of black heart iron, but he is handicapped by having no reliable means of telling just when he is on the danger line. Analysis would take too long and the fracture gives no true indication. If the silicon is too low, an inferior product will result, and still the purchaser if he be held to his specification can be forced to accept the castings.

*Per Cent of Manganese*

The Society of Automobile Engineers specification allows the manganese to be as high as 0.70 per cent. No one ever saw and no one ever will see black heart malleable iron of good quality with such a manganese content. Provided certain precautions are taken, and certain ratios made between certain elements in the product, it is possible to make a good product in which the manganese might be as high as 0.40 per cent, but to do so the manufacturer would have to be a master of his business and to know how to offset the evil effect of manganese.

The upper limit for phosphorus given, 0.20 per cent, is all right, but it is actually the extreme upper limit that should be tolerated. The American Society for Testing Materials allows 0.225 per cent as an upper limit for phosphorus, but this

is by far too high. I feel confident that a good product could not be obtained if this limit were reached.

No mention is made in the Society of Automobile Engineers' specification as to carbon content, or the permissible amount of combined carbon tolerated; nor is any limit placed upon the allowable amount of total carbon.

## DETAILED REPORT

**On Production of Plates, Sheets, Tin Plates and Terne Plates in 1912.**

The complete report of the bureau of statistics of the American Iron and Steel Institute showing the production of iron and steel plates and sheets, black plates, or sheets for tinning, and tin plates and terne plates in 1912, is shown in the accompanying tables.

In 1912 there were 131 works in 14 states which rolled plates or sheets, against 139 works in 15 states in 1911, 150 works in 17 states in 1910, 141 works in 17 states in 1909, and 117 works in 15 states in 1908.

In 1912 there were 39 works which rolled plates but did not roll sheets, 55 works which rolled sheets but did not roll plates, and 37 works which rolled both plates and sheets. At the close of 1912 three works to roll sheets or black plates were being built.

All the tinplates produced in 1912 were made of steel, but of the 191,396,000 pounds of terne plates about 11,259,000 pounds were made of iron and about 180,137,000 pounds were of steel, as compared with about 7,720,000 pounds of iron and about 150,721,000 pounds of steel terne plates in 1911. In 1911 and 1912, the iron terne plates were made in Pennsylvania and Ohio. Small quantities of pure lead coated and aluminum coated steel sheets were also produced in late years.

In 1912 our imports of tinplates, terne plates, and taggers' tin amounted to 2,052 gross tons, valued at $229,338, as compared with 14,099 tons in 1911, valued at $1,082,417, and 66,640 tons in 1910, valued at $4,502,862. Of the imports in 1912, 1,819 tons were obtained from Great Britain, against 13,843 tons in 1911, and 233 tons from other countries, against 256 tons in 1911.

In 1912 our exports of tinplates and terne plates amounted to 81,694 gross tons, valued at $6,315,763, as compared with 61,381 tons in 1911, valued at $4,776,256, and 12,455 tons in 1910, valued at $996,984. Of the exports in 1912, 47,095 tons were sent to Canada, 5,878 tons to China, 4,459 tons to Argentina, 3,901 tons to British India, 3,190 tons to Hong Kong, 2,924 tons to Japan, 2,673 tons to Brazil, 2,371 tons to Mexico, 2,037 tons to Cuba, 1,715 tons to the Straits Settlements, 1,452 tons to Chili, and 3,999 tons to the Philippines, Australia, Africa, Peru, and a few other countries. The maximum exports of tinplates and terne plates was reached in 1912, when over 8.4 per cent of the total output was sent to foreign countries.

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A syndicate headed by Frederick Johnson, of New York City, has been formed to develop a large acreage in the Bronx, composed of two parcels of about 100 acres each. The interests have incorporated as the Bronx Terminal Corporation.

PRODUCTION OF BLACK PLATES FOR TINNING

| States—Gross tons. | 1907. | 1908. | 1909 | 1910. | 1911 | 1912. |
|---|---|---|---|---|---|---|
| Pennsylvania | 253,807 | 278,163 | 308,982 | 427,530 | 483,576 | 563,738 |
| Md. and West Va. | 95,939 | 92,860 | 115,866 | 132,483 | 154,900 | 207,158 |
| Ohio, Ind., and Ill. | 154,326 | 142,748 | 181,634 | 152,124 | 157,122 | 211,301 |
| Total | 504,072 | 513,771 | 606,482 | 712,137 | 795,598 | 982,197 |

PRODUCTION OF TIN PLATES AND TERNE PLATES

| States—Pounds. | Tinplates. | Terne plates. | Total. |
|---|---|---|---|
| Pennsylvania | 1,179,468,000 | 81,872,000 | 1,261,340,000 |
| West Virginia | 347,544,000 | 86,030,000 | 433,574,000 |
| Ohio, Indiana, Illinois, and Michigan. | 438,647,000 | 23,494,000 | 462,141,000 |
| Total for 1912 | 1,965,659,000 | 191,396,000 | 2,157,055,000 |
| Total for 1911 | 1,597,629,000 | 158,441,000 | 1,756,070,000 |

PRODUCTION OF PLATES AND SHEETS

| States—Gross tons. | 1908. | 1909. | 1910. | 1911. | 1912. |
|---|---|---|---|---|---|
| New Eng., N. Y., & N. J. | 58,567 | 119,642 | 141,999 | 106,298 | 108,477 |
| Pennsylvania | 1,531,066 | 2,384,185 | 2,808,883 | 2,405,247 | 3,166,872 |
| Del., Md., and Virginia | 25,000 | 29,038 | 23,863 | 22,060 | 19,488 |
| West Virginia | 159,714 | 211,012 | 225,649 | 246,893 | 317,718 |
| Kentucky and Alabama | 45,473 | 70,639 | 69,610 | 67,930 | 65,598 |
| Ohio | 603,213 | 938,185 | 1,052,414 | 1,168,879 | 1,493,825 |
| Ind., Ill., Wis., Mo., Wyoming, and California | 226,660 | 481,645 | 633,066 | 470,742 | 703,102 |
| Total | 2,649,693 | 4,234,346 | 4,955,484 | 4,488,049 | 5,875,080 |

PRODUCTION AND CONSUMPTION OF PLATES AND SHEETS

| Years. Gross tons. | Production of plates and sheets. Iron. | Steel. | Total. | Add imports. | Deduct exports. | Approximate consumption. |
|---|---|---|---|---|---|---|
| 1900 | 1,794,528 | | 1,794,528 | 5,143 | 54,865 | 1,744,806 |
| 1901 | 2,254,425 | | 2,254,425 | 5,621 | 30,832 | 2,229,214 |
| 1902 | 2,665,409 | | 2,665,409 | 7,156 | 18,300 | 2,654,265 |
| 1903 | 2,599,665 | | 2,599,665 | 11,557 | 18,094 | 2,593,128 |
| 1904 | 67,713 | 2,353,685 | 2,421,398 | 4,165 | 55,204 | 2,370,359 |
| 1905 | 72,156 | 3,460,074 | 3,532,230 | 2,336 | 75,097 | 3,459,469 |
| 1906 | 74,373 | 4,107,783 | 4,182,156 | 3,231 | 110,700 | 4,074,687 |
| 1907 | 74,038 | 4,174,794 | 4,248,832 | 3,748 | 122,696 | 4,129,884 |
| 1908 | 54,033 | 2,595,660 | 2,649,693 | 2,629 | 104,993 | 2,547,329 |
| 1909 | 76,202 | 4,158,144 | 4,234,346 | 4,720 | 180,047 | 4,059,019 |
| 1910 | 91,118 | 4,864,366 | 4,955,484 | 6,152 | 274,521 | 4,687,115 |
| 1911 | 89,427 | 4,398,622 | 4,488,049 | 2,453 | 372,373 | 4,118,129 |
| 1912 | 75,044 | 5,800,036 | 5,875,080 | 3,300 | 546,521 | 5,331,859 |

# THE IRON TRADE REVIEW

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## The Government's Inconsistency

In all the loud talk about lower steel prices being made for export shipment than for domestic consumption, it will probably shock some gentle-minded folks to have called to their attention the fact that the United States government allows preferential prices for foreign business upon a most important commodity, which it has directly under its control.

It is a fact, nevertheless. Upon a tonnage of steel rails or any other finished steel product shipped from Pittsburgh to Buenos Aires, Tokio or Bombay, or to any other foreign point, the government gives the foreign buyer a substantial lift towards a lower price than that which its own citizens pay. This is in the form of a practically one-third differential in railroad freight rates to the seaboard. A buyer in New York pays the railroads 16 cents per 100 pounds, or $3.20 per net ton to haul rails or other forms of finished steel products from Pittsburgh to that city. A foreign buyer can have the same haul for 10½ cents per 100 pounds, or $1.10 less per net ton. A Philadelphia buyer pays 15 cents per 100 pounds, or $3.00 per net ton for the carriage of his steel from Pittsburgh. His foreign competitor taking steel through the port of Philadelphia can lay it down at seaboard at 9½ cents per 100 pounds, or $1.10 per ton less. To Baltimore the domestic rate is 14 cents per 100 pounds, or $2.80 per net ton. The export rate to that port is 9 cents per 100 pounds, or $1 per net ton less. Similar differences prevail between the Pittsburgh domestic and foreign rates to other seaboard cities.

These special export rates are in force by virtue of the sanction of the Interstate Commerce Commission, a direct agent of the government. They can be interpreted in no other way than that they are intended to encourage the upbuilding of foreign trade by American manufacturers, and are justified upon the ground of general benefit. Yet whenever any steel manufacturer or producer of manufactured articles of any kind follows the government's example and offers a special price, which often is intended to open a new line of foreign trade, he is severely criticized by many of those who speak for the government and is charged with unfair dealing with the home public.

No wonder Judge Dickinson, the government counsel, expressed his amazement when the existence of the double rates, a fact of common knowledge among steel producers, was brought forcibly to his attention and in response to his own line of questioning of a recent witness in the Steel Corporation suit. So utterly astounded did the erstwhile secretary of war appear that he questioned Mr. Farrell sharply upon the latter's answer to this effect and seemed in doubt whether he had heard aright. After all there has been said in recent years by "trust-busting" representatives of the government, by legislators *et cetera* as to the inequity of a steel maker clipping his domestic market price to attract a foreign buyer, it would appear that they have laid themselves open to a change of glaring inconsistency in their position. Otherwise, they must plead ignorance, as Judge Dickinson indicated upon his part to the existence of a governmental policy wholly at odds with their high-sounding declaration that a lower price made for foreign shipment is necessarily an improper discrimination against the home buyer, from a national point of view.

## Great Gains in Sheet and Tin Plate Industy

Remarkable records were made by the sheet and tin plate industries last year, according to the official statistics now presented. The output of sheets, 13 gage and lighter, including black plates for tinning, amounted to 2,839,880 gross tons, 32 per cent in excess of the production in either 1910 or 1911, those years having shown substantially the same total. There was almost a full doubling in the seven years from 1905 to 1912.

The vitality of this industry, or rather the strong tendency of consumption to grow, was illustrated by the fact that the total output of sheets and black plates made a new record in 1911, by a slight margin, whereas the output of most iron and steel products suffered a material decrease in 1911 over the record year 1910. Pig iron lost 13 per cent, while steel in-

gots and castings lost nearly 12 per cent. It was not surprising, of course, that a decided gain should be made in 1912, but the gain in sheets and black plates over the best previous year of 32 per cent, as mentioned above, contrasts with a gain of less than nine per cent in pig iron over any previous year.

The sheet and tin plate industry has easily reached a position of tonnage importance in the general steel industry. The designation "toy department" said to have been applied to the tin plate branch of the Steel Corporation by a former president, is by no means apt now, if it ever was. With the record made in 1912, it seems quite within the bounds of probability that this year's output of sheets and tin plates will reach the round figure of 3,000,000 tons, which would easily equal 12 or 13 per cent of the total rolled iron and steel output of the country. These products are pushing rails very closely, although it is not so many years ago that rails stood far ahead of any other finished steel product in tonnage importance. A rail output of as much as 4,000,000 tons this year is not altogether probable, so that a tonnage of sheets and tin plates three-fourths as great as that of rails is attained. In 1906, when a record rail output was made, the tonnage was 3,977,887, whereas in that year the output of sheets and black plates was 1,650,604 tons, or only 41½ per cent as great.

The occasion of this rapid expansion in sheet and tin plate production is the adaptability of the product. While there are very large factories consuming these products, a factory with very small and cheap equipment can compass the fabrication of sheets and tin plates into convenient articles used by the masses, and thus a ready stimulus to growth has been furnished. Many a large factory today is the outgrowth of a very humble shop only a few years ago. In the utilization of most other steel products, the beginning must be on a much more elaborate scale, and even in the case of wire, though light, certain peculiarities prevail whereby the small shop has not the chance it finds in sheet metal working.

## Where to Learn About Business

"Joshua Reynard," says the *Daily Blade,* "returned to the city last night from a three months' sojourn in California. Interviewed at his home, 2613 Goldplate avenue, Mr. Reynard said: 'I have been playing golf every morning and motoring every afternoon for 12 weeks and I think the business outlook is excellent—if there is enough money to go around. Of course, I have not been to the office yet, but we will probably have to raise our interest rates on account of tariff stringency, although if we have a good crop, it will all be easy sailing.'"

Such remarks appear regularly with the spring violets and to judge by them, the centers of finance and industry must be Pasadena and Palm Beach. In one case it's a banker, in another a mill owner, who comes back after a six-week lay-off to give out an interview full of cocksure opinions on the business situation. Meantime the real creators of the "business situation" say nothing, stay home, saw wood and only pause to smile at the mutterings of the pleasure seekers.

## No Cause for Alarm

In his recent testimony before the senate committee, which is investigating lobbying at the national capital, Senator Burton declared that "one of the most dangerous methods of influencing legislation and the one most to be condemned is the bombarding of senators with inspired telegrams, letters and resolutions of commercial, civic and other bodies." "Such methods," said the senator, "involve the lavish use of money, generally result in subsidizing publication and almost never represent the deliberate convictions of the petitioners."

It is undoubtedly true that, as the result of activities of various commercial and civic bodies, telegrams and letters are sometimes sent by men who have not given much thought to the subject involved, while often intelligent consideration is given by the senders. In any event, how this practice could be considered dangerous, is more than we can understand. If a member of congress is at all acute, he will understand about how much weight should be given to such communications. It is, however, the duty of all commercial and civic bodies to keep their members informed as to legislation affecting their interests. This is not only a duty, but a patriotic service, if properly carried out, and if, on account of being informed about legislation, members write or telegraph intelligently to their representatives at Washington, they are engaged in an entirely proper and praiseworthy act.

Commercial and civic bodies are a power for good and are destined to be even more influential, and we have no doubt will keep on informing their members as to legislation pending at Washington and at the state capitals. Accurate information, such as can be given by these bodies, is needed by the business men of the country, who, in spite of the comment of Senator Burton and other senators, are not yet willing to give up the right of petition, which includes the sending of letters, telegrams, resolutions, and any other proper methods of expressing opinions for or against any measure.

If the honorable senators cannot find anything more dangerous than the activities described by Senator Burton, no one need be alarmed for fear that undue influence is being used.

According to the *New York Sun,* the Hon. Augustus P. Gardner, the pugnacious Massachusetts Republican Congressman, who has strenuously opposed the Democratic tariff program, has taken himself to solitude in the wilds of Virginia. No doubt the woods would be full of discouraged senators and representatives who have tried to oppose the Democratic steam roller, were they to follow their own inclinations just now.

# Percival Roberts Testifies in Corporation Suit

## *Gives His Opinions on Trade Paper Reports—Tells of Experience With Pools—Judge Gary's Cross Examination on Methods and Policies*

*The two witnesses appearing for the defense last week, in the Steel Corporation dissolution suit, were Judge E. H. Gary, chief executive officer of the Corporation, and Percival Roberts Jr., a director and member of the finance committee. Judge Gary described the various policies of the Corporation. His remarks were devoted chiefly to "pools"; how he always opposed the making of price agreements between subsidiaries of the Steel Corporation and independent manufacturers and always ordered such agreements terminated when he learned of their existence. Judge Gary was taken in hand by the cross-examiner, Judge Jacob M. Dickinson, on Monday of this week.*

*Percival Roberts Jr., who occupied the stand on Wednesday, Thursday and Friday, told of the change from wrought iron making to steel making, which began about 1885. Prior to 1885, he said, it required very little capital to establish a puddling plant. With the introduction of the open-hearth furnace, however, and the abandonment of equipment for making wrought iron, large investments became necessary. He described the economic reasons underlying the various consolidations which took place in the late 90's, in the steel business, saying that the companies which went into the American Sheet Steel, American Steel & Wire, American Steel Hoop and other consolidated companies were forced to combine because of lack of capital or output, which would enable them to go into steel making on a commercially profitable scale.*

*The government attorney objected to most of Mr. Roberts' testimony on the ground that the witness had not based it on his own personal knowledge and experience, but had depended on information obtained from conversation with other people and from reports made out by other people.*

The direct examination of Judge Gary was completed Wednesday afternoon, June 4, and the cross examination was postponed in order to accommodate Percival Roberts Jr., who wished to be examined as soon as possible. Mr. Roberts' testimony was continued Thursday and Friday.

Mr. Roberts, who is a director and member of the finance committee of the Steel Corporation, and was referred to by Judge Gary in his testimony as one of the leading practical iron and steel experts of the country, was questioned by Cordenio A. Severance, of the Steel Corporation counsel.

Mr. Roberts testified that he began his connection with the iron and steel business in 1876, as a clerk in the office of A. & P. Roberts & Co., owners of the Pencoyd Iron Works. He was later made manager and in 1894, when the company was incorporated as A. & P. Roberts Co., he became vice president. In 1898 he became president of A. & P. Roberts Co., and in 1900, president of the then newly formed American Bridge Co. In the spring of 1901 he became a director and member of the executive committee of the Steel Corporation, but resigned from these offices in the spring of 1902. In 1909 he again became connected with the Corporation as a director and member of the finance committee.

Mr. Roberts reviewed the history of the iron business, describing its development and integration.

From 1890 on, the situation constantly became more acute as the various steps toward integration took place. As it became necessary to invest larger amounts of money in steel plants, it was also found desirable for each concern to control as many of the steps in the manufacturing process as possible. That the conditions attendant upon this period of integration were not as favorable to profitable business as after the consolidation period was over, was illustrated by Mr. Roberts by a comparison of the results of the panic of 1893 and the panic of 1907.

In 1893, the following concerns, he remembered, were in financial difficulties: Maryland Steel Co., Pennsylvania Steel Co., Catasauqua Mfg. Co., Pottsville Iron & Steel Co., Pottstown Iron Co., Diamond States Iron Co., Chester Rolling Mill Co., Moncour Iron & Steel Co., the predecessor of the Midvale Steel Co., a plate mill at Baltimore, and many others. In 1907, the only concern to go into the hands of a receiver, he said, was the Central Iron & Steel Co.

The price of steel rails was next discussed. This price of $28, Mr. Roberts said, was arrived at in a conference of makers and consumers. So far as he knew, there had been no agreement on the price of rails since 1901.

Mr. Roberts described how various economies had been effected by the Steel Corporation as the result of bringing many different companies into one organization.

He stated that in his opinion an iron and steel concern to adequately protect itself, should have an iron ore supply sufficient to last for at least 50 years. A large ore supply also was necessary to give a company the various kinds of ores suitable to economical manufacture of many different finished products. He said all the big steel companies have sufficient ore.

### *Have Enough Ore*

"All the others, you mean?" asked Mr. Severance.

"All the big steel companies," said Mr. Roberts.

"That is, all but the Steel Corporation?"

"All the big steel companies have laid in large ore supplies."

The minutes of the executive committee for 1901 recorded many offers by stockholders in other companies anxious to sell to the Steel Corporation. These concerns included the Youngstown Iron, Sheet & Tube Co., the Cleveland-Cliffs Iron Co., the Alabama Steel & Wire Co., the Columbus Iron & Steel Co., the Port Henry ore properties of Witherbee, Sherman & Co., Inc., and a number of others. At the various meetings in which these offers came up it was always voted "to instruct the president to decline the offer".

One offer was made by a certain individual who said he could secure for the Steel Corporation the coking coal properties of W. J. Rainey. This offer also was declined.

Prices published by trade papers were discussed at length by Mr. Roberts and Attorney Severance. The attorney was endeavoring to show that the testimony of Dr. Francis Walker, of the Bureau of Corporations, who testified as a government expert last November, was un-

reliable because it was based entirely on information obtained from trade papers, and as such was mere hearsay. Mr. Roberts testified that the trade paper quotations are theoretical and are simply the average of the sales that the trade paper reporters hear about. As an example of trade paper inaccuracy, he went back 17 years.

"In November of 1896, for instance," said Mr. Roberts, "the market price of beams, as quoted in the trade papers, was 1.53 cents, Pittsburgh, to which was added 0.25 cents per pound for New York delivery. The day following President McKinley's election I entered a contract for the Sherry building at 1 cent a pound. This price was immediately followed by like quotations on the part of other manufacturers, so that this 1 cent price became the market price. The trade papers, however, did not announce the new price until several months later, the following July, if I remember correctly. The trade journal prices are frequently fictitious."

"How long have you read the trade papers and which, in your opinion, are the leading ones?" asked Judge Jacob M. Dickinson, as he took the witness for cross examination.

"I have read *The Iron Age* and THE IRON TRADE REVIEW," said Mr. Roberts, "*The Iron Age* since I first entered the business in 1876."

"How much importance do you attach to the announcements of these publications?"

"I attach the same importance to the announcements of these publications that I would to any hearsay evidence," said Mr. Roberts.

The trade papers, the witness explained, make it a practice to establish their market prices as the result of what they hear from those in the trade. He never assumed, he said, that the trade paper quotations were used by buyers and sellers in conducting transactions. He always assumed that the buyers' and sellers' prices were different from the published prices. Each sale, he said, depends on the conditions surrounding it, such as the credit of the customer, the time of delivery, the size of the order, etc.

"What is the significance of the trade paper quotations?" asked Judge Dickinson.

*Just Like Thermometer*

"Well," said Mr. Roberts, "they have about the same significance as a thermometer."

"That is a pretty important significance, is it not?"

"Well, sometimes you are feeling different than the thermometer indicates," said the witness, "the trade papers only give a general idea of what is going on."

"Where, then, is the value in the publication of base prices by the trade papers?" asked the attorney.

"There is not much value," said Mr. Roberts. "It would depend on whether you were a buyer or a seller, to some extent. These prices were never accepted to do business on."

"Was the publication of these prices, then, a waste of space and a waste of time of the gentlemen connected with the trade papers?" asked Judge Dickinson.

"Not altogether," said Mr. Roberts.

"Well," shouted the government attorney, "what was the value of these prices?"

## Roberts and Quotations

*During his testimony last week, Percival Roberts Jr. made some interesting statements in reference to the market quotations published in the leading trade papers. At the conclusion of his examination he said to a representative of* THE IRON TRADE REVIEW:

*"What I tried to bring out in the examination was that the trade paper quotations necessarily are based on sales which have already been made. In other words, they are published as relating to what is past. Then, too, the trade paper quotations do not indicate the price at which all the business is being done, since each sale, of course, is a separate one and is made at a price based on the conditions peculiar to that transaction. I regard a trade paper quotation as a sort of mean or average of the prices at which sales were being made at the time the trade paper representative gathered his information."*

"Well, they never were accepted," said Mr. Roberts.

"Then they were discredited?"

"They were not discredited, but they were not accepted without being verified."

"Do you know that Judge Gary and Mr. Farrell and Mr. Schwab made it a practice to announce to the trade papers the prices at which the Corporation was doing business?"

"No, I did not know that. This information would come from the subsidiary companies."

"According to the testimony of these gentlemen while they were on the witness stand, such announcements were always made by them to the representatives of the trade papers. Now state whether the Corporation ever did business at different prices than the ones it announced."

"The Corporation," said Mr. Roberts, "always did business at various prices, depending on the conditions surrounding the sales. It did not necessarily make one sale at the same price or on the same terms that it would make another."

"So then the Corporation gave out a published price, but actually charged prices according to who the customers were, what they wanted, etc.; that is, were different prices charged for each party, the size of the lot, etc.?"

"It depended on conditions. Where conditions were equal, the same prices were quoted."

Judge Dickinson questioned the witness regarding the reliability of base prices as quoted in the trade papers. The witness insisted that sales as a rule were fixed at prices without regard to the base price.

"Then, there was no base price in reality?" asked Judge Dickinson.

"It depends on what commodity you are talking about."

"I am talking about them all. Take rails, for instance. Did you ever hear of a $28 base price for rails."

"No," said the witness. "I have heard of a price of $28 per gross ton on standard Bessemer rails, but I never heard of that being considered as a base price."

"Did you never hear of adding to $28 an extra cost due to the manufacture of rails to special analyses?"

"No, I never heard of that. The $28 price does not necessarily have any connection with the other prices."

"You testified yesterday, Mr. Roberts, that $28 was the minimum price for standard Bessemer rails. I will now ask you whether it was not also the maximum price."

"It was," said the witness.

*Why Hill Lease Went*

In direct examination, Mr. Roberts stated that he was a member of the finance committee when the Steel Corporation in 1911 decided to cancel the Hill iron ore leases. This action, he said, was taken for two reasons. The first was a commercial one, as the ore had not proven of the quality that was expected. The second was the criticism of the government as to the amount of the Corporation's ore holdings. The witness said that he believed at the time that the Corporation needed this ore, but that he had voted in favor of the surrender in harmony with the rest of the committee. Mr. Roberts was asked about the power of the Steel Corporation to drive its competitors out of business if it had the desire to do so.

"That would be a physical impossi-

bility," he said. "Even if the Corporation would attempt to put any of its competitors out of business, it would result in its own ruin, since in a war between a larger and a smaller concern, the larger suffers in the same degree as the smaller, in proportion to the comparative sizes."

The witness stated that the Corporation never in any manner sought to secure business by any unfair means, nor did it ever try to drive competitors out of business by charging a lower price in one section than it did in the other sections of the country. Neither the Corporation nor any of the other large steel companies, said the witness, charged premiums for prompt deliveries in boom times. He said that some of the advantages in having a large number of plants scattered throughout the country, were "conservatism, transportation and proximity to points of consumption."

Judge Dickinson next questioned Mr. Roberts at length in order to show that he was not as great an expert as Judge Gary described him to be. The witness stated that his actual experience was obtained at the Pencoyd Iron Works. Judge Dickinson mentioned a large number of different iron and steel commodities and asked the witness concerning his experience in them. Mr. Roberts admitted that he had a complete knowledge of only a few of them.

Mr. Roberts had testified in direct examination that the National Steel Co. was composed largely of concerns having blast furnaces that had lost their custom in pig iron and were forced to manufacture billets and blooms in order to sell to the concerns that formerly had made wrought iron.

Judge Dickinson proceeded to ask the witness in detail as to what mills and furnaces were owned by the companies that went into the National Steel Co., and what were the capacities and products of such mills and furnaces.

Mr. Roberts repeatedly answered that he did not know or did not remember. He said he based his testimony on general information and knowledge of the business. "I am not a walking directory," said Mr. Roberts.

Concerning other consolidations, Judge Dickinson pursued the same tactics in cross examination and with similar results. Mr. Roberts repeatedly said that he could not give the desired information and declared no man living had such knowledge.

# Mr. Roberts on the Operations of Pools

Mr. Roberts underwent further cross examination June 6. The government attorney, Judge Dickinson, first took up the witness' statement, made in direct examination, to the effect that standard Bessemer rails were sold at $26 per gross ton for a few months following the formation of the Steel Corporation.

"Do you recall having heard of any definite sale at this price?" he inquired.

"I cannot recollect any definite sale at that price," replied Mr. Roberts.

"And shortly after the formation of the Steel Corporation the price became $28 and has never been changed since?"

"That is correct."

"You stated that the policy of purchasing rails according to yearly requirements was first adopted by President Cassatt, of the Pennsylvania railroad, in the year 1900. Please state on what you based that testimony and whether you based it on knowledge you had at the time," directed the government attorney.

"I read about it in the trade papers and I heard it talked about at the time. Later, in 1906, when I became chairman of the supplies committee of the Pennsylvania railroad, I learned further about it by consulting the historical records of the company, as well as the officials of the Pennsylvania railroad."

"But you had no actual knowledge of your own in reference to this policy at the time that it was adopted?"

"None outside of that which I have mentioned."

"Then I object to the testimony regarding what was done by President Cassatt in the year 1900," said the government attorney.

Questioned about railroad rebates, Mr. Roberts stated that these have been done away with since the Interstate Commerce Commission has had full power.

Judge Dickinson inquired into the purchase of the Shelby Steel Co. by the National Tube Co. The government has contended all along that this purchase was made by the National in order to give it a monopoly of the seamless tube business in this country. The defense, on the other hand, claims that the National had made several attempts to enter the seamless tube business, but had been unable to develop a successful seamless tube process; its purchase of the Shelby resulted from the fact that the Shelby was the owner of a successful seamless process, which has been used by the National ever since in the manufacture of these tubes. The government attorney endeavored to have Mr. Roberts admit that the National was in control of a commercially adaptable seamless process prior to the time it took over the Shelby.

### *Advised Building Works*

Judge Dickinson then read the minutes of a meeting of the National Tube Co., October of 1900, in which President E. C. Converse advised that it would be desirable to go ahead with the Chrystie Park plant as speedily as possible as this would give the National a chance to compete in seamless tubes with the Shelby and the Standard Seamless Tube Co. It was also advocated by Mr. Converse that the National should endeavor to take over the Standard. The latter made seamless tubes by a piercing process which later was decided by the courts to be an infringement of the Shelby company's process.

Judge Dickinson reverted to the subject of "pools", concerning which Mr. Roberts had testified during direct examination.

"How many 'pools' did you have personal experience with?"

"I had actual experience with only one of them—the 'structural pool'."

"Then, did you confine your remarks in direct examination to the structural 'pool'?"

"No, but I think I specified when I talked about the structural and when I talked about the other 'pools'."

"Were the effects of all the 'pools' the same as the effects of the structural pool?"

"Yes, they all had agreements, allotments, etc."

"And fixed prices?"

"Not in all the 'pools' I knew of."

"Which 'pools' did you know of?"

"The plate 'pool', the rail 'pool' and the structural 'pool'."

"Oh! Then tell us about the plate pool."

"The only plate pool I know of," said Mr. Roberts, "was formed in 1900 and lasted till 1904. I never attended any meetings of that pool and I did not see any of its agreements until they were produced in the Stanley hearings."

"Tell us about the billet pool."

"I have only a hazy recollection of that."

"The rail pool."

"The same. I cannot recollect."

"Then you personally know the details only of the structural pool?"

"Oh, no," said Mr. Roberts, "I also know some of the details of the plate and other pools. The plate pool embraced the Central Iron & Steel Co., the Worth Brothers, the Illinois, Carnegie and Cambria Steel companies, and others."

"But you know only of the structural pool from personal contact?"

"That is so."

"Then I object to all of the witness' testimony with reference to pools," said the attorney.

*As to Reasonable Prices*

"What would you call reasonable regulation of prices by a pool?" asked the government attorney.

"A reasonable regulation of prices would be such that the prices charged would return a fair amount of profit," replied the witness.

"Suppose one plant made the goods cheaper than another plant?"

"It would enable the man who kept his establishment up to date to get a reasonable profit. The others would have to drop out."

"I am asking you now what you would call keeping prices within reasonable limits," insisted the attorney. "Explain what you mean by a reasonable profit."

"I said," explained the witness, "that a reasonable profit is a reasonable return upon the capital in a plant which had been kept up to the most advanced state of the art."

"Did all the members of the structural pool produce at the same cost?"

"There was not much difference, no serious difference."

"Did you actually, in getting at the price, take into account the producing costs of the various concerns in the pool?"

"Oh, yes," said Mr. Roberts, "we all knew each others' producing costs. We used to discuss these at the meetings and take them into account in establishing the price."

"Can you mention a specific meeting at which the costs of production were discussed?" queried Judge Dickinson.

"These costs were frequently discussed."

"Where were those meetings held at which these costs were discussed?"

"All the meetings were held at the Waldorf-Astoria."

"How did you communicate these costs to each other?" asked the attorney. "Did each manufacturer bring his cost sheets along?"

"Oh, no, we relied on the statements which each manufacturer made verbally. I frequently gave such figures for the Pencoyd company."

"Now tell me if the cost of the Pencoyd's production was the same as that of the Carnegie Steel Co."

*Little Difference in Costs*

"There was not much difference," said the witness. "Their pig iron cost was lower than ours, but from then on our costs were not greatly dissimilar. You see, wages at that time were lower in the east than they were in the Pittsburgh district, and in that way we made up to some extent in the difference of the cost of materials."

"Were the prices that were fixed by the pool such as to return a fair return of profit on the best mills like the Carnegie and Pencoyd?"

"Yes."

"Were not the production costs at the Carnegie and Pencoyd lower than they were at some of the old and antiquated mills in the pool?"

"Yes."

"Then, were the prices such as to return a fair profit on the smaller and weaker mills?"

"Yes."

"Explain that."

"Some of the older mills didn't get so much profit as the modern mills."

"You said the best mills got a fair profit," shouted the attorney. "Now, is it true that the older mills got a fair profit?"

"Yes," said the witness after thinking it over for a moment. "They got a fair profit, but one that was not quite so fair," and a general laugh went up.

"Do you know what the Carnegie company's conversion cost was in 1897, compared with previous years?"

"No."

"Tell us whether you would consider $4.50 too low to represent the Carnegie company's cost of conversion from pig iron to rails in 1897."

"A little too low."

"I object to that as improper cross examination," interrupted Attorney Severance, of the defense. "You are calling for an opinion by the witness."

"Well, the witness is smiling—I may get something good out of him. He probably knows," returned the government attorney.

"If you want to see me smile tell me you are through with me," said Mr. Roberts with a laugh.

"Would $4.70 be better?" asked Judge Dickinson.

"I cannot answer that question with accuracy, judge," said the witness.

Mr. Roberts was then excused from the stand.

# Judge Gary's Cross-Examination Started

Judge E. H. Gary, chief executive officer of the United States Steel Corporation, was recalled to the stand Monday morning, June 9, as a witness for the defense in the government's dissolution suit. He was first questioned by R. V. Lindabury in reference to his statement to the effect that a certain paper had been removed from his desk by stealth. This paper, Judge Gary had explained, was the only copy of an agreement which had been signed by Andrew Carnegie, H. C. Frick, H. H. Porter and himself, whereby the Federal and Illinois Steel companies, prior to the formation of the Steel Corporation, were to divide equally their total tonnage of rail bookings.

"Did you mean to state or to imply," asked the Steel Corporation attorney, "that you were under the impression that this paper was removed or was caused to be removed by counsel for the government in this case?"

"I did not," replied Judge Gary.

"Or that counsel for the government has any knowledge as to its present whereabouts?" interrupted Dickinson.

"I did not mean to create any such inference," replied the witness.

Mr. Lindabury then turned over the witness for cross-examination by Judge Dickinson. The latter first took up Judge Gary's assertion that of late years he has not been quite as familiar with the affairs of the subsidiary companies as in the years immediately following the formation of the Corporation. Judge Dickinson asked to have this statement explained.

"I meant," explained Judge Gary, "that of late years my responsibilities have increased to such an extent that I am unable to devote as much time to the details of management of the subsidiary companies as I did at one time. My duties have been the same as they are now for a period of about six years. Prior to that for a period of three years, they were not so great and still earlier, before that, back to the organization of the Corporation, they were still less great. Consequently, I have not been as familiar with the selling and other policies of the subsidiary companies as I was at one time and as I would like to be."

The witness was questioned as to the rigor with which selling policies have been enforced by the Corporation. Dur-

ing late years, he replied, the various policies have been enforced more strictly than in the earlier years of the Corporation's existence. For a few years after the organization of the Corporation, certain of the managers of subsidiary companies had ideas of doing business, of which Judge Gary disapproved.

"For instance, they would come and tell me that the Corporation was able to produce certain commodities cheaper than its competitors, and the only way to do business was to undersell them and drive them out. I would always say 'no'."

"Did the Steel Corporation have power to put its competitors out of business?"

"Yes, in its early days. But so could other manufacturers have done so. For example, Jones & Laughlin at that time could have put the Republic Iron & Steel out of business."

"Judge, you knew, did you not, that an act was passed in 1905 ordering an investigation of the iron and steel industry, and particularly of the capital and policies of the Steel Corporation and its place in the business?"

"No, I did not know that. At least, if I did know it, I have lost all recollection of it."

"Then as far as you can tell now, you never heard of it?"

"No, so far as I know now I never heard of it. And I do not know of any investigation made in pursuance of such an act."

"Judge, if the Corporation bought pig iron occasionally in order to sustain the market price of that commodity, would you call that 'fostering competition'?"

"Well, it would depend on conditions," replied the witness.

"I might say that I never approved of any such method of sustaining the market."

The government attorney mentioned several large purchases of pig iron which the Corporation made in 1904.

"Assuming that these purchases involved all the pig iron available at that time, would they have held up the market price?" he queried.

"These purchases," replied Judge Gary, "although I am not now speaking in reference to any special purchases, never involved enough tonnage to have an appreciable effect upon the market. The producing capacity of the country was altogether too vast for that."

"Judge Gary, what would you have to say if you heard that an official of the National Tube Co. had referred to that concern as a dominating influence in the tube business?"

The witness thought a moment.

"I would class that as a loose and careless statement."

"What would you regard as a dominating factor in a business?"

"I would regard a dominating factor as one having great influence in the business," said Judge Gary. "I would not, however, regard it as the controlling factor."

Judge Dickinson thereupon read from the minutes of the National Tube Co., held Jan. 21, 1902, at which were present, W. B. Schiller, Wm. H. Latshaw, Judge Gary, Chas. Steel, and other officials of the Tube company and the Steel Corporation. At this meeting Mr. Schiller reported that all the mills of the National were running full with the exception of the Oil City department. Mr. Latshaw, who was second vice president of the National at the time, submitted a report at this meeting in which he mentioned the "new policy of quoting prices" and the ability of the National, as a result of this new policy, to regard itself as in a position to dominate the trade.

"Did you know Mr. Latshaw?"

"I do not recollect ever having heard of him."

"Well, state what was this policy or selling plan to which he referred as just having been adopted."

"I don't know, judge. I may have known at the time, but I do not recollect the meeting now. I could, however, put an interpretation on what Mr. Latshaw said."

"Never mind the interpretation," said the government attorney, "I want your recollection."

"I would like to say here, Judge Dickinson, that prior to 1903 I was, so to speak, getting into the harness and I did not speak up in the meeting at that time as I have since then. There were a good many things in those days that might have been improved on and were later. By the end of 1903, I had pretty well shaped the policies which the Corporation was to follow and I had a finance committee that sustained me. I would like you to produce a minute of any meeting after 1903 at which any such statement as Mr. Latshaw's was made without my denouncing it."

Judge Dickinson then read a minute from a meeting of the Carnegie Steel Co.'s sales department, in which Col. H. P. Bope reported that "we now have all the best buyers tied up and have booked all the desirable contracts". The government attorney asked the witness to explain this statement by Mr. Bope.

"I think Col. Bope was blowing his horn when he said that," said Judge Gary.

"Do you think he was making misstatements when he said that?"

"I would not say that, but I would say that he was undoubtedly exaggerating what had been done by the sales department."

The government attorney then took up a number of contracts under which various independent manufacturing companies agreed to purchase all their requirements over certain periods from subsidiaries of the Steel Corporation. These embraced the National Tube Co. and the National Transit Co.; the American Can Co. and the American Sheet & Tin Plate Co.; the American Steel Foundries on one part and the Carnegie Steel Co. and the Illinois Steel Co. on the other; the Pittsburgh Steel Co. and the Carnegie Steel Co.; the Oliver Iron & Steel Co. and the Carnegie Steel Co.; the Crucible Steel Co. of America and subsidiaries of the Corporation, etc. The only one of these contracts which Judge Gary could definitely remember was the one between the American Steel Foundries on one side and the Carnegie and Illinois Steel companies on the other. The president of the Steel Foundries, he said, came to him and spoke in reference to purchasing steel. After a short conversation, Judge Gary turned him over to one of the Corporation's officials, who later reported that the contract had been made upon favorable terms. These terms, Judge Gary testified, he did not remember. The witness was asked whether the executive committee of the Steel Corporation did not on April 29, 1901, take up for discussion a "contract or other means to influence the Standard Oil Co. so that the latter would purchase all its requirements from subsidiaries of the Steel Corporation."

This question, which Judge Dickinson had framed from the minutes of the executive committee, was commented upon as follows by Judge Gary:

"At that time, the minutes of the executive committee were kept by a young man who had some knowledge of shorthand, but whom we desired principally to put in a position so that he might develop the ability which he showed promise of. This was Mr. Murray, who was only a young man then and who is now in a responsible position with the Corporation. He did not take the various remarks in the order and in the form in which they were submitted, but, on the contrary, he would write a sort of resume, telling what subjects had been considered and what conclusions had been reached at the meeting. Hence, his notes were entirely in his own language and the conclusions which he formed were those published in the minutes. You can, therefore, see that these minutes undoubtedly contained a great many inaccuracies."

"But did you not always have access to these minutes and could you not have corrected them at that time?"

"That is true," said Judge Gary. "I might add that if I had the right to a little access now, I think I should exercise it," said Judge Gary in a dry tone.

This reply afforded great mirth to the government attorney.

# IRON MINING NEWS

## Tax Case Appealed

Defeated in the circuit court at Bessemer, Mich., in its effort to recover $98,996 in taxes paid in 1911 under protest the Newport Mining Co., Milwaukee, will appeal the case to the supreme tribunal of the state. A verdict for the defendant, the city of Ironwood, Gogebic range, where the Newport mine is located, was directed by Judge S. S. Cooper. The suit was an outcome of the Finlay appraisal of the upper Michigan mines in 1911. The Ironwood board of review in July, 1911, fixed the valuation of the Newport property at $1,471,061. Due to the Finlay report, the state tax commission increased the assessment to $8,535,000, at the same time elevating the Steel Corporation's valuations a total of $13,799,100 over the amount fixed by the board of review. It was claimed by the Newport company that as a result of the action of the state body, it was assessed for more than its just share of the taxes, since the valuation of one class of property—the mines—had been arbitrarily raised to a full cash basis and property other than mines was continued on the roll at only a fraction of its actual worth. The company also contended that the method used by Mr. Finlay in appraising the mines was contrary to the provisions of the constitution and tax laws of the state. Mr. Finlay, in determining the value of the mines, took three factors into consideration: First, the average cost of producing ore for a period of five years; second, the average price for which the ore sold during the previous seven years; and, third, the future expectation and probabilities of the property. It was claimed by the company that this method resulted in a capitalization of its profits, and that the amount of the taxes was fixed upon this capitalization, while the tax laws and constitution of the state provide that the "cash value" of the property shall be determined by what the property would sell at in the market. It is one of the anomalies of Michigan's tax laws that while the Ironwood authorities had nothing to do with assessing the Newport at its increased valuation, the city was made the defendant as the collection agency for the state, county, school district and itself, and was compelled to fight the suit. Should the municipality eventually be defeated in the litigation, the amount of the judgment, nearly $100,000, will have to be reassessed and the Newport company called upon to pay a large part of the tax to satisfy its own judgment.

## Menominee Range Improvements

The Jones & Laughlin Steel Co., operator of the Forbes mine, in section 14, township 43, range 35, at Iron River, is improving the property in a substantial manner. The company commenced development work a year ago. Since then it has built a model brick dry house, as well as other buildings. A new cage hoist will be in operation shortly. A contract was let last week for the erection of several additional dwelling houses. Some ore is being shipped, but the principal work is in the development of the property.

Oglebay, Norton & Co.'s Chatham mine in the Iron River country has been equipped with an underground electric haulage system. Other recent acquisitions are a new shaft house and an ore crusher. Additional dwelling houses are in course of erection both at Lenox and Berkshire locations.

The Groveland mine, control of which recently passed to the Erie Ore Co., is idle at present. The property is in the Felch mountain district, Menominee range. It is reported unofficially that stripping the tract for the purpose of mining with steam shovel is in contemplation. The overburden is deep, however, and while open-cut operations doubtless would be practical, the preparatory work would necessitate a heavy expenditure. The Breitung interests of Marquette have a large deposit in a tract adjoining the Groveland and eventually, it is understood, will mine it by the steam shovel method. The overburden is materially less than at the Groveland.

## New Company at Crystal Falls

A newcomer in the Crystal Falls district is the Struthers Furnace Co., represented by W. Clark Runyon, of Cleveland. The company has taken a lease on the Hilltop and Victoria properties and will open the mines at once. Victor Laing, for 13 years with the Steel Corporation in the Iron River district, has been appointed superintendent. It is expected a force of 100 men will be employed in the development work.

## Longyear Mine Opened

Among the Mesabi properties shipping this year for the first time will be the Interstate Steel Co.'s Longyear mine, in the Hibbing district. The Longyear has been under development for the last two seasons. Approximately 2,000,000 cubic yards of overburden have been removed. While not altogether a novelty, a revolving steam shovel engaged in clearing the ore body at the Longyear has attracted much attention. The firm of Butler Bros., the contracting concern that has stripped the Longyear, is opening a Mesabi mine on its own account. This is the Roberts, in the Nashwauk district, which the firm has taken over under lease. The property contains a million or more tons of ore, covered with an overburden averaging probably less than 25 feet in thickness. It is expected to ship 250,000 tons this season. Butler Bros. also are stripping at the Larue mine at Nashwauk, this work being done under contract. The Wisconsin Steel Co. is mining briskly at the Hawkins. It is likely that 750,000 tons will be produced at this property this year, a considerable part of this output first going to the big washery at O'Brien lake for treatment before being forwarded to Lake Superior. The other mines at Nashwauk, the Pearson, of the Sellwood interests, and the Crosby, of the Cleveland Cliffs Iron Co., are shipping as usual. The Crosby, a milling pit, was in commission throughout the winter and started the season with a stock pile of 55,000 tons.

The Pearson Mining Co. will have a new Mesabi producer another year hence, and possibly late the present season. This is the Morrow property, southwest of Gilbert. A contract to strip the tract was entered into with Butler Bros. this spring and the work the Steel Corporation's Genoa mine, is now in progress. The Morrow is near the only open pit and the best shipper in the Gilbert district. The Genoa mine, season will duplicate its production of last year, which was in excess of a million tons. In the same field the Republic Iron & Steel Co. is shipping from the Schley and Pettit mines. The combined outgo fom the two is expected to appoximate 750,000 tons. The stock pile at the Schley is the largest on the range. Pickands, Mather & Co. are shipping briskly from the Malta and Elba mines.

# MEN OF THE IRON TRADE

**E. B. THOMAS**, president of the United States Steel Products Co., has gone abroad in the interests of his company.

**LLOYD H. ATKINSON**, rail sales agent of the Bethlehem Steel Co., sailed on May 31 for a two months vacation in Europe.

**E. H. GRAHAM** has been appointed superintendent of the order department of the Heppenstall Forge & Knife Co., Pittsburgh.

**ETHAN VAIL**, associate editor of the American Machinist, will be located in Cincinnati from now on as western editor of that publication.

**PHILETUS W. GATES**, president of the Hanna Engineering Works, 2059 Elston avenue, Chicago, sailed on June 10 for a six weeks' tour of Germany.

**L. H. BOWMAN**, formerly with the Carnegie Steel Co., has been appointed general manager of sales for the Heppenstall Forge & Knife Co., Pittsburgh.

**J. P. FOGARTY** has been appointed manager of the Westfield, Mass., motorcycle and bicycle plant of the Pope Mfg. Co., to succeed E. E. Hinsman, resigned.

**W. W. RAMSEY** was recently appointed general sales manager of the J. I. Case Co., Inc., of Racine, Wis., to succeed C. J. Farney, who becomes assistant treasurer.

**THOMAS J. DRUMMOND**, president of the Lake Superior Corp., who has been seriously ill for some time, is recovering and is expected to return to business in Montreal soon.

**PERCIVAL ROBERTS JR.**, director and member of the finance committee of the United States Steel Corporation, is about to leave for Europe, where he will spend the summer.

**H. G. CLOPPER** has been named general sales manager of the New Jersey Zinc Co., A. W. Dodd eastern sales agent, W. D. Main western sales agent, and E. V. Peters acting general purchasing agent.

**W. J. NUGENT JR.**, engineer of production at the Indiana Harbor plant of the American Steel Foundries, has resigned that position to become superintendent of the Sivyer Steel Casting Co., Milwaukee, Wis.

**WILLIS E. HOLLOWAY** and Paul W. Holstein, until recently with the Jeffrey Mfg. Co., Columbus, O., have become associated with the Roberts & Schaefer Co., engineer and contractor for coal-handling plants, Chicago.

**J. B. BERKEY** is president of the newly incorporated Tri-State Coal & Coke Co., First National Bank building, Pittsburgh. Other officers are J. Harper Adams, secretary, and P. E. Zinn, vice president and sales manager.

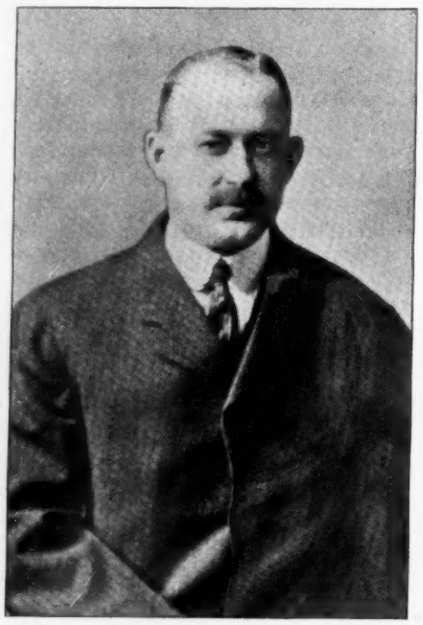
**THOMAS J. BRAY**, president of the Republic Iron & Steel company, sailed from New York last week for Germany to study by-product coke plants. He will visit the large steel plants and may go to Belgium and France.

**HARRY A. McKNIGHT**, superintendent of the Jeffersonville (Ind.) plant of the American Car & Foundry Co., is confined to his home in Louisville on account of serious injuries sustained from an accident in the yards recently.

**C. M. THOMSON**, of the firm of Hoggson Bros., New York, has been elected president of the American Hardware Corporation, succeeding Col. Charles M. Jarvis. Mr. Thompson was formerly western manager of the P. & F. Corbin Co., leaving there ten or twelve years ago to become a member of the Hodgson Bros. Co., contractor, New York City. He is a graduate of Yale, class of '83.

**CHARLES F. SMITH**, formerly president of Landers, Frary & Clarke, New Britain, Conn., hardware manufacturers, was recently made first vice president of the American Hardware Association, New Britain, Conn., succeeding the late Chas. H. Parsons.

**W. F. RUST**, new general superintendent of the Otis Steel Co., with offices at 1140 Leader building, Cleveland, has been in the iron and steel business since he was a boy. Before accepting his new position, he was for four years chief engineer of the Youngstown Sheet & Tube Co., Youngstown, O. Previously he had been employed by the United States Steel Corporation for four years, two years with the Illinois Steel Co. at Joliet and two years with the American Sheet & Tin Plate Co., at Pittsburgh. He entered the employ of the Steel Corporation from the Columbus Iron & Steel Co., Columbus, O., and previous to his connection with that



W. F. RUST

company he had been employed by the Georgia Iron & Coal Co., and other well known southern concerns. Mr. Rust is a young man but has had a variety of steel works experience.

**A. J. DULL**, Harrisburg, Pa., has been elected president of the Pulaski Iron Co., Pulaski, Va. Other officers are E. P. Borden, Philadelphia, first vice president, and Horace L. Haldeman, Philadelphia, second vice president, secretary and treasurer.

**WILLIAM G. JOHNSTON**, whose death was noted recently, was the father of Stewart Johnston, president of the Pittsburgh Steel Foundry Co., well known in the iron and steel world. On account of advanced age the elder man had passed from the view of many in the business.

**A. C. DAVIS** is president of the recently incorporated American Tank & Pump Co., Cincinnati, which will locate its plant in Dayton, O. Other officers are Amos Lint, vice president, P. E. Studebaker, sales manager, W. F. McCloud, general manager, and J. P. Davis, superintendent.

**A. L. ANDREWS**, president and treasurer of the Newport Rolling Mills, Newport, Ky., has returned from Sewell's Point, Fla., where he has spent the winter, having gone there last December. Mr. Andrews has a winter cottage at that place, where he has been spending his winter vacations.

**SAMUEL B. SHELDON**, whose recent connection with the Minnesota Steel Co., Duluth, of the United States Steel Corporation, was noted in this department of last week's issue of THE IRON TRADE REVIEW, was elected general superintendent of that company, instead of president, as then stated.

**HENRY J. FULLER**, president of the Canadian Fairbanks, Morse Co., has been elected vice president of the Fairbanks, Morse & Co., Chicago, to take charge of the eastern business, with headquarters in New York City. Mr. Fuller will continue as president of the Canadian company, spending a large portion of his time in Canada.

**W. WALKER WEAR**, purchasing agent for the Chicago Tunnel Co., the Chicago Warehouse & Terminal Co., and the Illinois Telephone & Telegraph Co., has moved his office to the Chicago Tunnel Co. building, 754-756 W. Jackson boulevard. Mr. Wear formerly served in the same capacity for the Edgar Allen American Manganese Steel Co.

**WILLIAM E. COREY**, former president of the United States Steel Corporation, returned from Europe May 30. Mr. Corey is quoted as saying that he was glad the country was going to have a reduction of the tariff and that he believed it would bring about a reduction in the cost of living, though there might be a temporary reduction of wages in some trades.

**M. S. HAWKINS**, superintendent of the Virginia mining district of the Oliver Iron Mining Co., resigned his position June 1. Mr. Hawkins, who has spent 14 years with the Oliver people, and before going to Virginia had charge of the company's mining interest at Iron Mountain, expects to take up his residence in western Canada, where he owns a large ranch.

**E. F. MULLIN**, formerly engaged with the Heyl & Patterson Co., and later engineer for the Jeffrey Mfg. Co., Columbus, O., has severed his connection with the latter concern to join the engineering staff of the Link Belt Co., at Philadelphia. Mr. Mullin has had extensive experience in the designing and construction of tipple equipment and general coal-handling machinery.

**CHARLES M. JARVIS**, president of the American Hardware Association, New Britain, Conn., has tendered his resignation on account of ill health. Colonel Jarvis succeeded the late Philip Corbin as president three years ago. He has been identified with the corporation since 1900, when he withdrew as the active head of the Berlin Iron Bridge Co.

**JAMES D. RHODES** has been elected a director of the Pittsburgh Valve, Foundry & Construction Co., to fill a vacancy caused by the death of J. Grant Anderson. Mr. Rhodes is president of the Pennsylvania Casting Machine and the National Car Wheel companies.

**L. C. HEUSMANN** was elected president of the Union Foundry Co., Anniston, Ala., at a recent meeting of the stockholders. Other officers elected are: J. B. Bahm, vice president; Genard Schumacher, second vice president and general manager; E. F. Niedecken, treasurer; S. H. Bell, secretary.

# TRADE NOTES

AKRON, O.—The annual convention of the Whitman & Barnes Mfg. Co., Akron, O., and Chicago, was held at Akron on Tuesday and Wednesday of this week, June 10 and 11. All the company's representatives and salesmen in the United States and Canada were called together to exchange views and report on conditions as they have found them and outline plans for the 1914 selling campaign. The convention terminates Wednesday night with an annual dinner given by the company to its outside representatives.

ANNISTON, ALA.—The offices of the Anniston Iron Corporation and the Cedartown Iron Co., which have been located at Cedartown, Ga., have been transferred to this city. The Cedartown company and the Anniston company were formerly the Woodstock Iron Co., the pioneer iron industry of Anniston. The two companies are under the general management of J. B. Carrington.

ANSONIA, CONN.—The H. C. Cook Machine Co. has filed a preliminary certificate of dissolution, signed by H. C. Cook, L. P. Cook and C. S. Carter.

BETHLEHEM, PA.—Chas. M. Schwab will shortly establish a complete printing plant at the Bethlehem Steel Corporation, at Bethlehem.

BUFFALO—The Buffalo office of the American Bridge Co. has been moved to the Marine National Bank building, Main and Seneca streets.

CHICAGO.—The National Screw & Tack Co. has moved its Chicago office from 305 Peoples Gas building to Machinery Hall, 541 West Washington boulevard.

CHICAGO.—Hoeft & Co., die makers, machinists, and machine builders, have recently moved to their new building at Ashland avenue and Kinzie street.

CHICAGO. — The Independent Pneumatic Tool Co. will exhibit a complete line of Thor air tools at the Master Mechanics and Master Car Builders convention in Atlantic City, June 11 to 18.

CINCINNATI.—E. D. Moody, cashier of the Dennison, O., National Bank, has been appointed receiver for the Dennison Foundry & Machine Co. Receivership was requested by Hall & Griffith, Cincinnati, manufacturer of foundry supplies.

CINCINNATI.—The capital stock of the Cincinnati Screw & Tap Co., Cincinnati, has been reduced from $50,000 to $1,000. The company was recently placed in the hands of a receiver, and all of the assets have been disposed of with the exception of a few accounts which the receiver is endeavoring to collect. The company has no plans for the future.

CINCINNATI.—At the annual meeting of the stockholders of the Ruthven Railroad Signal Co., which was recently held in the Grand Hotel, Cincinnati, the following officers were elected for the ensuing year: President, Chas. M. Evans, Cincinnati; vice president, Samuel Avritt, Louisville; secretary and treasurer, Emil G. Schmitt, Cincinnati; directors, J. F. Muller, New Orleans, Charles Miller, Hamilton, O., F. F. Hudson, Memphis, Tenn., and William Stoffregan, Jacksonville, Fla.

CLEVELAND.—The Pattison Supply Co. during the past week has filled a fair volume of orders from Ohio customers, including a boring mill, gear hobbing machines and lathes.

CONWAY, MASS.—The Conant & Donelson Co., manufacturer of screw cutting tools, advises that its sales have nearly doubled in the last four months, and that trade conditions in the small tool products appear very favorable.

ELKINS, W. VA.—The Davis Colliery Co. announces the following appointments, effective June 2: R. B. Isner, general sales manager, to be assistant general manager; J. W. Bischoff, chief engineer, to be acting general superintendent, vice J. F. Healy, general manager of mines, resigned. The offices of general sales manager and general manager of mines are abolished.

ERIE, PA.—City officials and councilmen have taken steps to arrange an agreement between the union molders who are on strike in several Erie shops and the foundrymen. The manufacturers have replied to a request for recognition of the unions that they have five or six times as many non-union men working daily and they cannot permit 250 to 300 men striking from a dozen plants to dictate the policy that must govern 1,200 to 1,500 employes. The situation looks like a settlement within a few days on the main points of the trouble started last December.

FREMONT, O.—A. H. Jackson, president of the Fremont Furnace Co., has asked for the appointment of a receiver for that company. J. W. Pero, president of the Colonial Savings Bank, has been named receiver. Insufficient capital is assigned as the reason for this action.

HAMILTON, ONT.—The city proposes to build the biggest electric sign in the world to advertize the city. It will be a mile in length, and will bear three words. It is planned to be placed along the mountain brow, 100 feet high, and is estimated to cost $100,000.

JOLIET, ILL.—The Illinois Steel Co. has prepared an educational exhibit in connection with the "safety first" appliances and other life and time-saving devices being shown at the Adam Arcade this week.

KANSAS CITY, KAN.—The Kansas City Foundry Co. has signed a new scale for molders giving 40 cents an hour. Four concerns still refuse to pay more than 36 1-3 cents an hour.

LOUISVILLE, KY.—The Louisville board of trade has concluded a membership campaign, resulting in the addition, among others, of the following concerns: American Boiler Works, W. T. Pyne Mill & Supply Co., Brandeis Machinery & Supply Co., the National Foundry & Machine Co., and Hines & Ritchey, the latter a copper working establishment.

NEW YORK CITY—The Quigley Furnace & Foundry Co., Springfield, Mass., has moved its New York office from 50 Church street to 26 Cortlandt street.

NEW YORK CITY.—The American Gas Furnace Co., 24 John street, advises that it is enjoying a liberal demand for automatic heat controllers for gas furnaces. The company recently received an order for twenty of these heat controllers for installation in one plant.

NEW YORK CITY.—The Tirrill Gas Machine Lighting Co. is inaugurating this year a co-operative sales plan in the interest of closer relations between themselves and the iron trade. E. Strauss, the general manager, states that this plan has been well received by selling agents throughout the country.

NEW YORK CITY.—Francis Dykes and Forsyth Wickes, receivers for Milliken Bros., Inc., New York, have reported to the court they made $63,427 running the company's structural plant on Staten Island from February 13 to April 23. The report shows current assets of $976,053 on April 23 and current liabilities of $913,526.

NEW YORK CITY.—The Parson Mfg. Co. 149 Broadway, manufacturer of boiler furnace equipment, is changing its official staff. President Henry E. Parson gradually is withdrawing from the active business, and although he remains as president the active management is committed to George L. Prentiss, vice president. Stuart H. Parson, secretary, has assumed the duties of treasurer, and Charles H. Parson, acting treasurer, has retired. H. M. Parson remains as chief engineer and is in charge of experimental work with fuels and general investigation and consulting work. The construction department is in charge of Wylie G. Wilson. The operating staff remains under the control of Joseph E. Cannon. The company reports a marked increase in its business.

PHILADELPHIA.—A creditor's petition was recently filed to have the Vulcan Charcoal Iron & Steel Co., of Crum Lyn, Delaware county, adjudged an involuntary bankrupt, by J. Jones Hudson, creditor to the extent of $4,999.45.

PITTSBURGH.—The Latshaw Bradley Co., People's Bank building, Pittsburgh, has been appointed district agent for the Emery Machinery Co., Bradford, Pa., manufacturer of gas engines and gas-driven compressors.

PITTSBURGH. — Executive and sales offices of the Blaw Steel Construction Co., Pittsburgh, have been removed to the new plant at Hoboken, Pa., the city sales offices remaining at 1203-14 Westinghouse building. The new plant is in full operation.

PITTSBURGH.—At a recent meeting of the board of directors of the Pennsylvania Steel Co., Edgar C. Felton, president, and the other present officers, were re-elected for the ensuing year. Frederick W. Wood, Sparrows Point, Md., is vice president; Frank Tenney, secretary; Edmund N. Smith, treasurer, and Frank S. Reitzel, comptroller. The latter three are all of Philadelphia.

SHAMOKIN, PA.—Property of the Susquehanna Foundry & Machine Co. was sold at sheriff's sale to Attorney J. Howard Patterson recently for $525. It is estimated to be worth several thousands.

WAYNESBURG, PA.—The Waynesburg Pressed Steel Co., advises newspaper accounts of the fire at its works were exaggerated greatly. The real loss was about $500. Repairs have been completed and the works again are in full operation.

WHEELING, W. VA.—An order has been entered in the United States court at Wheeling designating the First National bank of New Cumberland, W. Va., as repository for the funds involved in the bankruptcy case of the Davis-Price Foundry & Machine Co., New Cumberland.

# NEW BUSINESS

*A review of the machinery market during the past week shows scarcely any change from the week previous. Manufacturers are rapidly reducing their volume of unfilled orders, while dealers and other large buyers are not inclined to lay in any additional stock in preparation of future needs. The general status of the market appears to be a waiting game with both the buyers and sellers, in anticipation of the final outcome of the tariff bill now pending in congress. The present tightening up in the money market bids fair to add a new feature to the machinery business, wherein the manufacturer will demand prompt payments to provide a working capital, which will not be favorable to the buyer, thus throwing the burden of securing an active market upon the middleman.*

In New York, machinery dealers experienced another week of quiet business. Sales consisted of single pieces of machinery, with few exceptions. In only a small number of cases were buyers more liberal with orders. The Pennsylvania railroad was the largest individual buyer, placing a part of the business on which the machine tool trade was asked to enter bids some weeks ago. Several contracts have recently been placed for large electric cranes, and there are a number of important propositions pending, including some heavy apparatus of that class. The government has added to its list of shop equipment intended for the Pearl Harbor naval station. Included in this list is an exceptionally large lathe measuring 48 feet on the base and having a swing of 120 inches. The machine will weigh about 215,000 pounds. It is expected that the Lackawanna railroad will take action during the current month on bids submitted in May on about 20 machine tools.

In Chicago, the optimistic spirit noticed in other lines is evident in the machinery market, but the bulk of the business continues to be made up of small transactions. No large lists have come out and some of the railroad requirements are still pending. This includes a part of the machines recently listed by the Santa Fe and practically all of the Northwestern requirements for its new shops at Clinton, Ia. This indicates that the reluctance of the railroads to complete purchasing at this time is general and is not confined solely to mill products. Local dealers are in no way discouraged, as very good sales have been made during the past week and there are indications that good inquiry will come out in the near future.

In Cleveland, there has been scarcely any change noted during the past week in the machinery market as compared to the week or two previous, except a slight falling off in both number and extent of inquiries. Orders continue in fair volume, but dealers believe this cannot exist much longer if the larger interests maintain their present policy of filling only the most pressing needs. Opinions regarding the possible effect of the proposed tariff reduction on machine tools differ widely, but the majority of dealers believe the pending legislation is in large part responsible for the present "close" condition of the market, and express themselves as being anxious to have the matter settled soon, one way or another.

In Cincinnati, practically no change can be noted in the machinery market. It is reported that the railroads have recently bought some equipment, mostly machine tools, but these are probably of a scattering nature and generally single machines as they are needed. Second hand machinery has slumped, and business along this line is not very encouraging, as has been the case for some time. Small electrical equipment is selling in slightly better lots, and mixing machinery, which is by far the best seller at the present time, is holding fairly strong, with a fair demand.

## ALABAMA

BIRMINGHAM.—The Earle estate is planning to erect a five-story business building at 1918-20 First avenue, estimated to cost $60,000.

BIRMINGHAM.—The chamber of commerce has requested the board of city commissioners to order an election authorizing a bond issue for the erection of a large auditorium.

BIRMINGHAM.—A petition for a further street car franchise for the Birmingham Railway, Light & Power Co., has been filed by the East Lake Land Co., with the city commission.

BIRMINGHAM.—Bids will be received by the board of revenue of Jefferson county until June 16, for the construction of a steel bridge, 90-foot span, with 108-foot approach, over Five Mile creek, near Brookside. Address J. W. Gwin, Room 103, Court House.

BIRMINGHAM.—The Turner Electric Supply Co., recently organized, has purchased the stock of the Southern-Wesco Supply Co., which has organized. The officers of the new company are, Oscar C. Turner, president; James J. Fitzsimmons, vice president; William M. Bowles, secretary; J. D. Turner, treasurer.

GADSDEN.—The A. & J. Mfg. Co., manufacturer of stoves and ranges, will start the erection of an addition to its plant within a few days.

GADSDEN.—The new plant of the Gadsden Pipe Co. on Ninth street is nearing completion, and will probably be in operation early in July.

MONTGOMERY.—The United States War Department will receive bids until June 20 for furnishing lock-gates, etc., at this place.

TUSCALOOSA.—A large saw mill will be erected on the Joyce timber tract near Tuscaloosa by its new owner, a company headed by C. A. O'Neal of Andalusia.

YORK.—The A. T. & N. Railway Co. has started work on the foundations of its new shops at this place. President Cochran is reported to have stated that the contract for the steel work has been awarded, but that the machinery equipment was yet to be purchased.

## ARIZONA

DOUGLAS.—The Calumet & Arizona Mining Co. recently blew in its new $2,000,000 smelting plant at Douglas.

PHOENIX.—The Hassayampa Canal, Irrigation & Power Co. has been incorporated; $120,000; by J. R. Deal, Hot Springs Junction, president; R. A. Roberts Sr., Wickenburg, vice president; H. Deal, Hot Springs Junction, secretary; J. T. Cochran, Wickenburg, treasurer; R. A. Roberts Jr., Wickenburg.

## CALIFORNIA

FRESNO.—The Burnett Iron Works, structural iron and steel fabricators, which

recently suffered a considerable loss from fire, has erected a new shop and considers future business prospects as being exceptionally good. J. Brooks, formerly engineer for the Pacific Rolling Mill Co., is now associated with the Burnett organization.

LOS ANGELES.—The Morrow Double Cycle Engines & Pump Co. has been incorporated; $75,000; by M. L. Morrow, E. Willefold, F. H. Plaistridge and D. C. James.

LOS ANGELES.—The Pacific Metal Products Co. has been incorporated; $500,000; by E. Double, W. L. Stewart, R. Watchorn, H. W. Wells and C. L. Cliff.

LOS ANGELES.—Steel has been ordered for the construction of a new siphon, to replace the Sand Canyon siphon on the aqueduct, which recently gave way. The loss was estimated at $80,000.

LOS ANGELES.—F. P. Newport is reported to have announced that the nut and bolt factory which will be the first unit of the California Industrial Co.'s steel plant, will probably be in operation by Aug. 1. The site of the factory is adjacent to Dominguez Harbor Tract, one of the F. P. Newport Co.'s harbor developments.

SAN DIEGO.—The city council is considering a proposition to install a municipal machine shop.

SAN FRANCISCO. — The Ravenswood Compound Motors Mfg. Co. has been incorporated; $10,000; by H. Conyers, J. F. Parkinson, S. E. Weaver, J. Hopkins and W. H. Hope.

## COLORADO

DENVER. — The Chicago, Burlington & Quincy Railway Co. is planning to begin work on its terminals here.

DENVER. — The Denver & Rio Grande Railroad Co. has awarded a contract to the Roberts & Schaefer Co. for the building of two large counter-balanced locomotive coaling stations, for installation on its line at Salida.

DENVER.—The Colorado Fuel & Iron Co. has called a stockholders' meeting for June 17, to vote upon the question of authorizing in accordance with the Colorado laws, a transfer of all the real estate of the Colorado Fuel & Iron Co. to the Colorado Industrial Co. The consideration is understood to be $14,067,000 par value of debentures of the Colorado Fuel & Iron Co. outstanding.

## CONNECTICUT

BRISTOL.—The Wallace Barnes Co. advises an addition to its plant, 50 x 90 feet, four stories, is being built. It will be used for spring and screw machine product manufacturing.

NORWALK.—The installation of additional equipment in the municipal electric light plant at East Norwalk is under consideration. Fred H. Bergen, superintendent of the plant.

WATERBURY.—The Chase Corporation of Waterbury, has changed its name to the Chase Metal Works, Inc.

WATERVILLE.—The Berbeck & Rowland Mfg. Co. is having plans prepared for extensive additions to its plant at Thomaston avenue. A building 43 x 152 feet, one-story, will be added to the dip-room, and a one-story casting-shop, 43 x 122 feet, with a wing 12 x 33 feet, will also be erected. The architects are Griggs & Hunt, 111 West Main street, Waterbury, Conn.

## DELAWARE

DOVER.—The Minas Gereas Iron Co., New York City, was recently granted a charter with a capital of $150,000. Thomas T. Trapnell of New York City was the principal incorporator.

## DISTRICT OF COLUMBIA

WASHINGTON.—The Department of the Interior will receive bids until June 24 for furnishing machinery, etc.

WASHINGTON.—The Navy Department will receive bids until June 14 for furnishing electric hoists, etc.

WASHINGTON.—The Navy Depot, bureau of yards and docks, will receive bids until June 21 for furnishing cranes.

WASHINGTON.—The Isthmian canal commission will receive bids until June 21 for furnishing two lock-entrance floating caissons.

WASHINGTON. — Alfred W. Donegan, American consul at Magdeburg, Germany, advises the city council has authorized the construction of a new bridge across the Elba river, at an estimated cost of $857,000.

WASHINGTON. — The following foreign trade opportunities are noted in the Daily Consular and Trade Reports. Inquiries in which addresses are submitted are on file at the bureau of foreign and domestic commerce. In applying for addresses refer to file number:

No. 11066. Engines, boilers, etc.—In the army and navy budget for the Netherlands for 1913 an expenditure of about $24,000 has been included for boilers and engine shop equipment and accessories; also about $800,000 for ship building and maintenance, and $486,000 for torpedoes, projectiles, etc.

No. 11068. Pipes and fittings.—Tenders are invited by the Bangkok Sanitary Department, Bangkok, Siam, for supplying about 49,200 feet of galvanized water pipes varying from ½ to 2½ inches in diameter and fittings, required in connection with a water-supply scheme. Bids will be received until July 15.

No. 11070. Railway construction.—The municipality of Rovereto, Austria-Hungary, will receive tenders for constructing a railway from Mori via Arco to Riva, at an estimated cost of $263,000. Particulars may be obtained of the chief magistrate, Rovereto.

## GEORGIA

MACON.—Steel will replace the wooden joists in the Spring street bridge, bids for which will be called the latter part of the month. Estimated cost $13,000.

SAVANNAH.—Reports state that the Brinson railroad is planning to remove its shops from Springfield to Savannah. Shop capacity will be increased and new equipment added.

## IDAHO

BOISE.—The Baxter Foundry & Machine Co. has been awarded the contract for the structural steel needed for the new Elks' building, at a cost of approximately $12,000.

KELLOGG.—The voters will pass on $30,000 bond issue for sewer system for this city on June 16. Entire cost of proposed improvement will be $36,000.

MOSCOW.—The county commissioners are receiving bids on steel bridge across Palouse river, three and one half miles east of Palouse.

PARMA.—The Beaver River Power Co. has been let a franchise to construct and operate a sub-station here.

## ILLINOIS

CHICAGO.—Secretary McAdoo of the United States Treasury department, recently ordered the installation of a government lighting and power plant for the Chicago post office building.

CHICAGO.—W. C. Heimbeck, 852 E 63d street, is preparing plans for the erection of a brick and steel, one story, 30 x 65 feet building for the Hellmuth Cooperage Co. at 5217 S. Western avenue.

CHICAGO.—A. S. Alschuler, 28 E. Jackson boulevard, is preparing plans for the reconstruction of the printing shop of the Regenstein Color Type Co., Centre and Jackson boulevard. The building will be brick, six stories, 100 x 126 feet, and will cost $100,000.

CHICAGO.—A permit has been granted to the West Coast Co., manufacturer of roofing, for the erection of a one and two story factory building at 1462 W. 76th street, to cost $70,000. The company is now located at 18th street and Michigan avenue.

CHICAGO.—At a recent meeting of the county board a resolution was adopted to construct a power house in connection with the new county hospital. The commissioners authorized an expenditure of $246,000 for this purpose.

CHICAGO.—Work on the Baldwin Locomotive Works' new $5,000,000 plant at Calumet-East Chicago is expected to start about July 1. The main building will be 600 x 1,150 feet. The contract for the foundation has been let to Strauss & Co., Chicago, and the grading to A. F. Hartigan & Co. A. S. Woodle and F. S. Ray have charge of the engineering work.

EAST MOLINE.—Deere & Co., agricultural implement manufacturers, expect to complete this summer the new foundry buildings which are under construction at the present time.

ELGIN.—Bids for the construction of a steel standpipe, 500,000 gallon capacity, will be received by the city council until June 14.

JOLIET.—The Joliet Mfg. Co., manufacturer of corn shellers and jobbers of the Field-Brundage engine, advises that it recently received some large orders from South America and South Africa.

PEORIA.—The International Harvester Co. of America advises no definite arrangements have been made yet for a building at Peoria, but that the company hopes to put through a deal which will give a new warehouse for transferring and handling the company's products.

## INDIANA

ANDERSON.—The Sefton Mfg. Co. contemplates an addition to its splant.

ANDERSON.—The Dice Engine Co. has been incorporated; $50,000; by E. F. Dice, H. P. Fisher and J. Podmore.

BOONVILLE.—The Warrick County Coal Co. has been formed with $350 000 capital stock and will proceed with the development of a large tract of coal land by the stripping process. Will H. Hays, Sullivan, Ind., has details.

ELKHART.—The city contemplates the

erection of a bridge over the St. Joseph river at a cost of $50,000.

ELWOOD.—B. F. Lambert, president of the Buckeye Mfg. Co., Anderson, which manufactures the Lambert automobile, recently sold his holdings in this company to G. A. Lambert and James A. Burke, who were alreay interested in the company, and purchased a controlling interest in the Elwood Iron Works.

EVANSVILLE.—The Orr Iron Co. will move into its new plant at Walker and Pennsylvania streets within a short time.

JEFFERSON.—The United States Depot Quartermaster will receive bids until June 22 for furnishing boilers, etc., at this place.

LAWRENCEBURG. — Commissioners of Hamilton and Dearborn counties recently approved the plans and specifications for a $76,000 steel bridge, 600 feet in length, three spans, to be built over the Whitewater river as an intercounty bridge.

LOGANSPORT.—Cass county commissioners have disposed of a $150,000 issue of emergency bonds to Breed, Ellit & Harrison, Cincinnati and Indianapolis. The fund will be used to replace five bridges swept away by the March floods, contracts for which have already been awarded to the National Concrete Co., Indianapolis.

MADISON.—The Jefferson county commisioners have awarded bridge contracts to the St. Louis Bridge Co. and the Vincennes, Ind., Bridge Co.

MARION.—Work will start at once on a one-story brick storehouse, 106 x 200 feet, for the Snyder Preserve Co. L. L. Johnson & Son, Marion, are contractors.

## IOWA

ALTON.—Mason & Mason have been let a franchise to construct and operate an electric light plant.

BURLINGTON.—The Chittendon & Eastman Co. is having plans prepared for a seven-story brick and concrete sample room on Third street, adjoining its present building. Specifications will call for an automatic sprinkler system.

DUBUQUE.—Fischer & Co. will start work at once on an ice plant to cost $100,000, contracts for which have been placed. The machinery will be furnished by the Vilter Mfg. Co., Milwaukee.

RUSSELL.—The construction of a municipal electric light plant is under consideration.

SPENCER.—C. W. Gray and J. G. Duffield have purchased the machine shop formerly owned and operated by N. W. Weis.

WATERLOO.—The Swift Mfg. Co., maker of tanks, heaters, etc., has recently completed an addition to its plant.

## KANSAS

TOPEKA.—The Perfection Metal Silo Co. has recently completed a new factory building which it now occupies.

## KENTUCKY

BURNSIDE.—The Burnside Bridge Co. has applied to the War Department for permission to erect a drawbridge over the south fork of the Cumberland river.

CORBIN.—The municipality has awarded the contract for the new water works system to the American Light & Water Co., of Chicago, whose bid was $26,794.

COVINGTON.—The Cincinnati Pulley Machinery Co., whose building was destroyed by fire during the recent flood, is having plans prepared for a new building on Third, between Madison and Scott streets, which will be 52 x 180 feet, two stories. Geo. W. Schofield, architect.

LOUISVILLE.—B. B. Davis, Inter-Southern building, is the architect for an institutional building which will require a large and varied equipment.

LOUISVILLE.—Additional manual training, vocational and continuation schools are planned by the board of education, which is arranging for a $1,000,000 bond issue.

LOUISVILLE.—Two electric elevators will be installed in the county court house. The award will be made by the fiscal court. Address the clerk.

LOUISVILLE.—Additional machinery will be needed by the Art Brass & Plating Works, 448 S. Fifth street, which plans to increase its capacity materially. Carl Rindt is president.

LOUISVILLE.—Extensive power equipment in the Hope Worsted Mill plant, which was sold in bankruptcy proceedings recently, is being offered for sale by the Fidelity & Columbia Trust Co. of this city.

LOUISVILLE.—The purchasing agent of the American Creosoting Co. will shortly begin figuring on the structural steel requirements of buildings being erected at Indianapolis, Ind., in connection with a new plant there.

SHELBYVILLE.—Machine tools will probably be purchased by Hackworth & Cowles for installation in an automobile repair shop which is now under construction.

SOMERSET. — The Cincinnati, New Orleans & Texas Pacific railway is expecting to be in the market for additional equipment subsequent to improvements now being started at its Ferguson machine shops here. (Noted June 5.)

## LOUISIANA

SHREVEPORT. — The Henderson Iron Works Co., W. K. Henderson, president, has taken over the Cedar Grove plant of the Timpson Handle Co., in lieu of a claim held against that company.

## MAINE

PORTLAND.—The Imperial Machinery Co., Inc., has been incorporated to manufacture and deal in all kinds of machinery, appliances, etc.; $1,000,000; by E. W. Freeman, president and treasurer.

RUMFORD.—The P. B. Clarke foundry and machine shop was badly damaged by fire June 5.

## MARYLAND

BALTIMORE. — The Western Maryland railroad has awarded the contract for remodeling the Hillen station to the Cowan Building Co.

BALTIMORE. — Terminal improvements involving the expenditure of between $10,000,000 and $12,000,000 for the Northern Central railroad, a subsidiary of the Pennsylvania railroad, are being planned. The railroad company proposes to enlarge the existing yard trackage and terminals and otherwise increase the capacity for handling freight.

HAGERSTOWN.—The Western Maryland Railroad Co. recently started construction work on the new $150,000 repair shop being added to its plant here.

HAGERSTOWN.—The Tohmas W. Pangborn Co. has been awarded the contract by the Isthmian canal commission, for the installation of a $6,000 sand blast system in the new steel foundry to be erected in Panama.

## MASSACHUSETTS

BOSTON.—The Carbon-Okygen Engine Co. has been incorporated; machinery, etc.; $500,000; by A. H. Rhodes and A. P. French.

BOSTON.—A cold storage plant estimated to cost $1,000,000, is to be erected on the new fish pier in South Boston. Plans have been completed and the work of driving piles, on which the building will rest, will probably begin at once. The building will be of steel and concrete construction, 220 x 252 feet.

QUINCY.—The name of the A. B. Robbins Iron Co. has been changed to the Norfolk Iron Co. by the retirement of A. B. Robbins. Councilman Gilliat, formerly general manager, becomes president and general manager. The company has a large number of contracts on hand for ornamental iron work.

SPRINGFIELD.—The Indian Orchard Co., Indian Orchard, is planning an addition to its plant on Front street. The new structure, which is to be of brick, concrete and steel construction, is estimated to cost $15,000. It will be 60 x 100 feet, one story.

WORCESTER.—The Worcester Gas Light Co. is completing plans for the expenditure of $50,000, for the additional buildings, machinery and other general improvements to its plant.

## MICHIGAN

BATTLE CREEK.—Construction work will start soon on the new building for the Michigan Metal Products Co. and the Electric Nail Co.

DETROIT.—The Buhl Malleable Co. will begin work soon on a new pattern shop building which will be brick, two stories, 32 x 52 feet. Hinch & Grylls, 710 Washington Arcade, Detroit, will take bids.

DETROIT.—The Aluminum Casting Co. will erect a new building of brick and steel construction, one story, 40 x 60 feet. The Forest City Engineering Co., 409 Superior building, Cleveland, is taking bids.

DETROIT.—A large machine and truck shop is to be erected at La Belle avenue and the Terminal railroad during the coming summer by the D. U. R. The building will be 245 x 306 feet, one story, estimated to cost $15,000.

GRAND HAVEN.—Plans are being prepared for repairs to the Spring Lake bridge, approximating $20,000.

JACKSON.—The additions to the shops of the Michigan Central railroad at Jackson Junction are being rushed to completion. The addition to the machine shop is 140 x 240 feet, and the new blacksmith shop will be 105 x 205 feet. The cost of the buildings is estimated at $150,000.

KALAMAZOO.—The Wm. E. Hill Co. is considering plans for changes and improvements to its plant, the details for which have not yet been decided upon.

KALAMAZOO.—The National Cable &

Mfg. Co., of Niles, recently absorbed the Cook Standard Tool Co. and the name of the company has been changed to the National Standard Co. The capital stock of the new company will be $150,000, while all the officers will retain their former positions. The company manufactures blowers, automobile and railway jacks and track tools.

MARQUETTE.—The Duluth, South Shore & Atlantic Railway Co., 904 Fidelity building, Duluth, Minn., is having plans prepared for the erection of a one-story brick boiler house to cost $4,000.

## MINNESOTA

CHISHOLM.—The city has rejected the bids that were recently taken for pumping plant improvements to cost from $15,000 to $30,000.

DULUTH. — The plant of the Mesaba Boiler & Mfg. Co. is working overtime with a volume of marine, mining machinery and general orders on its books. Included in the list is an order from the Duluth-Superior Dredge Co. for two dredge spuds, each 55 feet long by 40 inches square and weighing 30 tons.

DULUTH.—Bids are being taken by the Northern Power Co. for machinery to be used in connection with the installation of its additional motor generator set. Contracts will be awarded at once for the electrical generator water wheel and pipe line. This will increase the company's power from 48,000 to 68,000 horsepower and the installation will involve the expenditure of $300,000. W. R. Ryerson, manager.

MINNEAPOLIS.—The Canadian Steel Pipe Co., of Winnipeg, Man., has been awarded the contract for supplying the city of Minneapolis with 10,000 feet of 48-inch lock bar steel pipe.

ST. PAUL.—The American Paper Stock Co. has awarded a contract for steel sash to the United States Steel Sash Co.

## MISSISSIPPI

CORINTH.—The Corinth & Northwestern Railway Co. has received a charter to build a line from Corinth, Miss., to the Tennessee river, near Harrisburg.

## MISSOURI

PLEASANT HILL.—The Reliance Machine Co., manufacturer of pitless scales and pump-jacks, has developed a good business in the year that it has been operating.

ST. LOUIS.—The Oliver Electric & Mfg. Co. has increased its capital stock from $25,000 to $50,000.

ST. LOUIS.—Henry W. Blodgett, St. Louis attorney, announces that William White & Sons, of New York City, private bankers, engaged in improvement of real estate, will build a steel frame hotel to cost $1,800,000, at the northeast corner of Olive and Twelfth streets, St. Louis. Work is expected to start July 1. The proposed hotel will front 126 feet on Twelfth street and 225 feet on Olive street. Plans for the hotel were completed a short time ago in the office of Herman Lee Meader, a New York architect. Bids will be asked for soon. The hotel will have 700 rooms.

## MONTANA

ANACONDA.—The board of county commissioners will receive bids for construction of an electric driven elevator to cost not more than $10,000.

THOMPSON FALLS.—The Montana Power Co. and the Anaconda Copper Mining Co. are making preparations to begin work immediately on new buildings for a plant which will furnish power to operate trains on the Milwaukee railroad.

## NEW JERSEY

CHATHAM.—The following awards have been made by the Common Council providing for the equipment for the recently authorized addition to the municipal electric light and water plant: One 100-kilowatt turbo-generator unit $4,612; one 75-kilowatt, three-phase generator and exciter, 2,300 volts, and one switch-board complete, $1,766, to the Fort Wayne Electric Works, one 500,000-gallon pump, water driven, $1,245, and one 150-horsepower condenser, $723, to Maxister Iron Working Co.

ELIZABETH.—The Waclark Wire Co. has taken out a permit to build an addition to its plant in Elizabeth. The improvement is estimated to cost $18,500.

JERSEY CITY.—The Warren E. Green Co. will erect a two-story brick factory building to cost $75,000. The building will be located on West Side avenue, near Audubon avenue.

JERSEY CITY.—The Jersey City Machine Co. has been incorporated; machinist, founder, mechanical engineer, etc.; $50,000; by A. Schwarz, Bayonne; H. Porter, New York City; H. W. Wienoke, Long Island City.

NEWARK.—Plans have been filed by the Hudson Hat Co., New Hoyt and Searing streets, for a factory building, to cost $8,000.

NEWARK—The Newark Sheet Metal Co. has been incorporated to deal in sheet metal goods; $100,000; by J. B. Cella, F. A. Cella and T. Santore, all of Newark.

TRENTON.—The New Jersey Northern Gas Co. has received permission from the Board of Freeholders of Trenton, to lay new gas mains on county roads between Pennington and Hopewell.

## NEW YORK

BROOKLYN.—The E. W. Bliss Co. has awarded the contract for the structural steel for an extensive erecting shop at its plant on Plymouth street.

BROOKLYN.—L. & M. Bruckerman will build a new factory building on Woodhaven avenue, north of Byrne place, Ozone park, 75 x 200 feet. Estimated cost $32,000.

BUFFALO.—The Larkin Co. will erect a new building at 614-18 Carroll street, eight stories, of reinforced concrete. Estimated cost $100,000.

BUFFALO.—The Clark-Banks Foundry Co. recently incorporated for $10,000, is planning to build an iron foundry, 45 x 60 feet, at 1418-30 Niagara street.

BUFFALO—The Buffalo Draft Gear Co., Inc., has been incorporated to manufacture and deal in draft gears, car couplers, etc.; $10,000; by J. J. Kanane, Martin J. Ryan and T. J. Kanane, all of Buffalo.

BUFFALO.—Operations have been started with one of the two new Talbot continuous open-hearth furnaces which are being installed at the plant of the Lackawanna Steel Co. The second furnace will be put in operation in the near future. The new furnaces are of 200 tons capacity each and are expected to add about 250,000 tons to the annual ingot output of the company.

CARTHAGE.—The Carthage Machine Co. has plans for an addition to its machine shops, 50 x 60 feet, two stories.

ELMIRA.—The Carroll Engine Co., Inc., has been incorporated to manufacture and deal in engines and mechanical devices; $250,000; by J. D. Carroll, 410 East Third street, and Jos. Beach, 1003 Walnut street, both of Elmira, and E. M. Lowman, Wellsburg, N. Y.

LOCKPORT.—The New York Central & Hudson River railroad has prepared plans for new freight terminals at Lockport, estimated to cost $100,000.

LONG ISLAND CITY.—The Goodyear Import Co. has applied for a permit to erect a five-story factory building at Jackson avenue and Honeywill street, at an estimated cost of $35,000.

LONG ISLAND CITY.—The Neptune Meter Co., Jackson avenue and Crane street, has taken out a permit to erect a five-story concrete factory building in Long Island City.

NEW YORK CITY.—The J. L. Mott Iron Works has contracted for an extension to its brass foundry at Trenton, N. J.

NEW YORK CITY.—The General Electric Co. has awarded a contract to the American Bridge Co. for the construction of an addition to its plant at Lynn, Mass.

NEW YORK CITY.—The Solidhead Tack Co., Inc., has been incorporated to manufacture and deal in thumb tacks, novelties, etc.; $25,000; by H. Pressrich, 254 Seventy-ninth street, Brooklyn, and A. P. Jackson and J. L. Jackson, both of Bronxville, N. Y.

NEW YORK CITY.—The Master Suspension Co., Inc., has been incorporated to deal in patented novelties, machinery, etc.; $25,000; by L. R. Divine, 42 Fifth avenue, New York City, H. S. Clutsam, Far Rockaway, N. Y., and A. N. Wright, Rockaway Park, N. Y.

NEW YORK CITY.—The Elevator Automatic Signal Co., Inc., has been incorporated to manufacture and deal in safety devices for railways, etc.; $50,000; by G. Bok and C. E. Moore, both of 78 Wall street, New York City, and A. H. Williams, 232 East Fortieth street, New York City.

NEW YORK CITY.—The Israel & Pine Mfg. Co., Inc., has been incorporated; metal and brass fixtures; $15,000; by C. I. Apfel, 6818 Tenth avenue, and A. Kamenl, 1312 Forty-second street, both of Brooklyn, and Lucien Ebert, 165 East 128th street, New York City.

NEW YORK CITY.—The Cotton Machinery Co., Inc., has been incorporated to manufacture machinery, engines, etc., especially for cotton; $10,000; by W. H. Brady, 559 West Twenty-sixth street and E. L. Austell, 431 Riverside drive, both of New York City, and E. W. Smith, 102 Underhill avenue, Brooklyn.

NEW YORK CITY.—The Alliance Machine Co., Alliance, O., has recently received the following orders for cranes through its New York office: One 30-ton four-motor crane for the General Electric Co. for its plant at West Lynn; one 25-ton four girder double trolley ladle crane for the Orford Works of the International Nickel Co.; one 40-ton crane of 84-foot span, two 15-ton cranes, four 10-ton cranes, five 5-ton cranes and three-motor mill type cranes for the Lehigh plant of the Bethlehem Steel Co.

PORT BYRON. — The American Steel

Scythe Co., Inc., has been incorporated to manufacture and deal in hay knives, scythes, corn knives, etc.; $10,000; by J. O. Bruce, 30 Lewis street, G. A. Owlett, 27 Morris street, and R. J. Benham, 15 Liberty street, all of Auburn.

RICHMOND HILL, Staten Island. — The Home Coal Co. will erect a series of steel coal pockets on Stewart avenue.

ROCHESTER. — The Rochester Can Co. has filed plans for a one-story addition to its plant on Hague street.

ROCHESTER.—The Buffalo, Rochester & Pittsburgh Railway Co., which is considering several additions to its shops here, will be in the market soon for machine tools and other equipment.

ROCHESTER.—The Rochester Bronze & Aluminum Co., 77 West Water street, has plans prepared for a foundry, 60 x 87 feet, one story, estimated to cost $10,000. Gilbert E. Clump, architect.

SANDY HILL.—The Friction Pulley & Machine Works, manufacturer of special pulp and paper mill machinery, is installing electric motors for driving the machine tools.

UNION SPRINGS.—The Combo Engineering Co., Union Springs, recently incorporated with a capital of $20,000, will manufacture a line of power plant steam specialties, including water columns with alarms, electric signalling gages, recording mechanisms and automatic regulators. The company has a fully equipped shop for this line of manufacture and will market its products itself. Lewis Beebee is president and general manager, Wm. Shoemaker, vice president, and F. W. Shoemaker, secretary and treasurer.

## NORTH CAROLINA

CHARLOTTE.—The Thrift Mfg. Co. is reported to be considering the purchase of the new plant being built here by the Thayer Mfg. Co.

DALLAS.—The Piedmont Metal Roofing Co. has been incorporated to manufacture metallic shingles; $25,000; by H. M. Clemmer, et al.

GOLDSBORO.—The Automatic Pipe Co. has been incorporated; $25,000; by E. H. Bain, J. H. Hawley and Paul Yelverton, all of Goldsboro.

## OHIO

AKRON.—Building permits aggregating $125,000 have been issued recently by the building inspector, the largest of which was issued to the Star Drilling Machine Co., for two buildings, one costing $23,000, and the other $9,000.

AKRON.—The board of county commissioners will open bids June 27, for the construction of a steel plate girder bridge on East North street, to replace the structure washed away by the March flood. Plans on file with county engineer and with the Wilbur J. Watson Co., Leader building, Cleveland.

ALLIANCE.—The Gibson Motor Car Co. is planning to build a plant here, the main structure of which will be 85 x 250 feet.

CANTON.—The Stark Electric Street Railway Co. will start active work on the construction of a road between Alliance and Akron early this fall.

CINCINNATI.—The construction of a viaduct from Sixth and Baymiller streets to Eighth and State streets, is being considered.

CINCINNATI.—An automobile repair shop will be built at Reading Road and McMillan street, Cincinnati, within the near future by J. D. Campbell, of that city. The building will be about 40 x 80 feet, one story.

CINCINNATI.—Bids will be received until July 3 for the construction of a bridge on the Baen road in Symmes township. Stanley Struble, president board of Hamilton county commissioners.

CINCINNATI.—The mechanical stokers to be used in the new Gibson House, now being erected on Walnut street between Fourth and Fifth streets, Cincinnati, will be furnished by the Murphy Iron Works, of Detroit, Mich. The contract for this work was let the latter part of May.

CINCINNATI.—The Reliance Engineering Co., Cincinnati, is preparing plans for a water-gas plant at Lebanon, O., to have a capacity of about 750,000 cubic feet. The plant will be 30 x 50 feet. Larger pipes will also be laid throughout the city. A bond issue of $25,000 was passed to promote the proposition.

CINCINNATI.—At a meeting of incorporators of the St. Nicholas Co., Cincinnati, which was held a few days ago, the proposed 12-story building to be erected within the near future at Fourth and Race streets, that city, was practically assured. The building will, under all probabilities, be of the steel skeleton type, and architects will be appointed soon to begin work upon the preliminary plans. The president of the company is S. D. Peacock, Cincinnati.

CINCINNATI.—The Hill-Brunner Foundry Supply Co., 2109 South street, has been organized by John Hill and Fred J. Brunner, both well known in the foundry business. Mr. Hill formerly was head of another foundry company and has been in the business 30 years. Mr. Brunner formerly was associated with the S. Obermayer Co. for 15 years. The company will manufacture high grades of plumbago, core compound, partings, core washes and sea coal facings and will supply the trade with all kinds of foundry equipment. Besides the foundry in Cincinnati the company has one at Chattanooga, Tenn., and a warehouse at Birmingham, Ala.

CINCINNATI.—The American Laundry Machinery Co., Cincinnati, will enlarge its plant in the near future. The addition will be about 126 x 240 feet, with a seventeen-foot basement, and will contain about 17,600 feet of floor space. Part of the improvements will be two stories in height, the second floor to be used for office space. The remainder will be used to enlarge the plant's manufacturing facilities. The plans were made by Architect C. C. Taylor, of this city, and most of the important contracts for building have been let. The L. Schrieber & Sons Co., Cincinnati, have secured the contract for the structural iron to be used, and E. Greiwe & Sons, also of Cincinnati, the sheet metal work.

CINCINNATI.—The Ideal Steel Wheel Co., Winton Place, Cincinnati, advises that it is making extensive additions to its factory in the way of a separate office building and that it contemplates the erection of improvements to the main factory, which will accommodate a spring-making and forging department. The company has also recently purchased a multiple spindle drill equipped with 20 spindles, an electric spot welder for various welding operations, a large flat turret lathe, a No. 2 punch press and several heat treating furnaces, pyrometric equipment for said furnaces, and a cold galvanizing plant. The company also advises that it contemplates the addition of various other machines of a more special character within the near future, some of which may have to be designed and built to order.

CLEVELAND.—The board of county commissioners will open bids July 2, for the construction of bridges in Strongsville township, plans for which are on file with Frank R. Lander, county surveyor, John F. Goldenbogen, clerk.

CLEVELAND.—The Federal Metal Co., recently incorporated, has purchased a building site on Morgan avenue S. E., for a brass foundry. The company is at present receiving bids for the construction of a building on this property.

CLEVELAND. — The National Screw & Tack Co. has awarded a contract to the D. C. Griese & Walker Co. for the construction of an addition to its plant, 54 x 210 feet, five stories and basement, of brick and steel construction, with reinforced concrete floors.

CLEVELAND.—The Otis Steel Co., which for some months has had plans drawn for a plant to be located in the Cuyahoga river valley, has let the first formal contract to the American Bridge Co., covering about 2,500 tons of structural steel, principally for the first unit of the Otis finishing mills. A contract has been given to the Morgan Engineering Co., Alliance, O., for one 3-high, 72-inch plate mill, in two stands. The William Tod Co., Youngstown, has been awarded the contract for three jobbing mills, complete.

DAYTON.—The board of commissioners of Montgomery county, has disposed of a $300,000 issue of emergency bonds to the Dayton Savings & Trust Co. The issue is to be used for the re-construction of bridges and other county property destroyed during the March floods.

DELAWARE.—Plans are being considered for the construction of five bridges in this county, of either concrete or steel, bids to be opened July 7.

ELYRIA.—The Union Tool Co., Los Angeles, Cal., has purchased the plant of the Elyria Gas & Power Co. Improvements and enlargements are being considered.

FOSTORIA.—The Allen Motor Co. advises it has just been incorporated with a capital of $500,000 and has not yet elected officers. The company will build a plant, but will not be ready for material equipment for some time.

LEBANON.—T. C. Patterson, county auditor, will open bids June 23 for one single span high truss steel bridge, to be constructed over the Little Miami river at Foster.

LEETONIA.—The United Engineering & Foundry Co., Pittsburgh, has the contract for a three-high bar mill for the works of the Leetonia Steel Co.

MANSFIELD.—A. E. Courtney, county auditor, will open bids June 30, for the construction of the Newville bridge superstructure, Alexander bridge, Darling bridge and the Culler and Bee Miller bridge superstructures.

MARION.—The construction of three bridges in this county washed out by the March flood is being considered.

McDONALD.—It is expected the new cinder crushing plant of the Carnegie Steel Co. at McDonald, will be ready for operation by June 15. Its capacity is about 20 to 25 carloads a day.

NILES.—The Deforest Sheet & Tinplate Co. is to add a jobbing mill for blue annealed sheets, 10 gage and lighter and up to 48 inches wide. Four additional sheet mills are to be added, making ten in all and a low pressure turbine for a 1,250-kilowatt generator is to be installed.

SPRINGFIELD. — County commissioners have disposed of a $100,000 issue of emergency bonds to Seasongood & Mayer, Cincinnati. The money will be used for bridge repair work.

ST. MARYS.—The St. Marys Machine Co.

has increased its capital stock from $250,000 to $300,000.

TOLEDO.—The American Construction Co. has a contract for enlarging the plant of the Acklin Stamping Co.

TOLEDO.—Stockholders of the Cincinnati, Dayton & Toledo Traction Co. will meet on June 23 to effect the terms of a lease by which the property is operated by the Ohio Electric Co., and also the adjustment of the capitalization.

TOLEDO.—The Ohio Die & Tool Co., located at Buckeye and Ketcham streets, manufacturer of special machinery, is arranging to move its equipment to a new building at Bancroft and Monroe streets, in order to secure more room. New machinery approximating $10,000 has been ordered and will be installed this week.

TROY.—The Troy Foundry Co. resumed operation recently under the direction of Receiver J. B. McCoole. (Noted May 29.)

## OKLAHOMA

OKLAHOMA CITY.—The Boardman Co., manufacturer of tanks and concrete accessories, is doubling the size of its plant and installing new equipment. The latter has been purchased from Jos. T. Ryerson & Sons, Chicago.

OKLAHOMA CITY.—The first run new foundry of the J. B. Klein Foundry & Wire Co., 1025 West Second street, was made June 6. The building is 65 x 135 feet. A second building, 50 x 140 feet, will be started early in August.

OKLAHOMA CITY.—The N. S. Sherman Machine & Iron Works has been awarded the contract for the construction of the government pipe line from Fort Sill to a connecting point on the 16-inch main running from Law-ton-ka dam to Lawton. (Noted May 22.)

TULSA.—The Tulsa Boiler & Sheet Iron Works has completed its new plant at Berry and Owasso streets, and has started operations there.

## OREGON

CLATSKANIE.—W. L. Snider & Son, Stella, Wash., have purchased the burned Palm mill property. The debris will be cleared and new plant erected at once.

EASTSIDE.—E. C. Drews, manager of Coos Bay Home Telephone Co., has applied to the city council for a franchise to sell water and electric power and light in the city.

McMINNVILLE.—The county commissioners have authorized steel bridge across Yamhill river at Carlton, Jones & Flagg, McMinnville, are the engineers in charge of plans.

PORTLAND.—The Umpqua Mining Co. has been incorporated; $1,000,000; Henry Banfield, Thos. F. Harrington, and Chas. C. Banfield.

PORTLAND.—The United States engineers, Couch building, received bids for 11 pairs of locks for Dalles Celilio canal. The bidders were: Independent Bridge Co., Pittsburgh, low; Pennsylvania Bridge & Construction Co. and Portland Bridge Co., Portland. The quantities required and the low bid on each are as follows: 1,730,000 pounds structural steel, $7.44; 40,000 pounds forged steel, 10c; 420,000 pounds cast iron, 9c; 140,000 pounds cast iron, 7c; 1,000 pounds bronze phosphor, 65c; 7,500 pounds, babbitt metal, 15c.

SALEM.—The order for steel and other material for bridge across North Mill creek is being placed by P. E. & E. Ry. Bridge will cost $10,000.

## PENNSYLVANIA

ALLENTOWN.—George H. Hardner, of Allentown, received the contract for the roundhouse and locomotive repair shop at the Bethlehem Steel Works. The roundhouse, 160 feet in diameter, will store 20 locomotives. The two buildings will cost $50,000.

ALTOONA.—A number of the larger buildings in the downtown district will be improved and remodeled during the coming summer months.

ALTOONA.—McClenthan Bros., of Reedville, have broken ground near Naginey Station for an electric power plant, with a capacity of 1,000 horsepower, with facilities for enlargement.

BOYERTOWN.—The Union Mfg. Co. is planning to enlarge its foundry, in order to accommodate a rush of orders.

CHESTER.—A jury appointed by the court has recommended that a new bridge of wider span be built across the Ridley river on Morton avenue.

ERIE.—The Erie City Iron Works, has sold to the Standard Tin Plate Co., Canonsburg, Pa., an 18 x 24-inch four-valve engine to be direct connected to a 200-kilowatt generator. Another recent sale is a similar engine installed for the Mammoth mines of the H. C. Frick Coke Co., in Westmoreland county, Pa.

ERIE.—With a new iron and steel structural building for Hamot hospital costing $158,000, and a similar structural extension for the Malleable Iron Works costing $150,000 underway, the building operations in Erie increased $495,158 to the end of May over the first five months last year. The total this year up to May 1, of $1,186,435, does not include the General Electric Co. and other factory additions outside the city limits and estimated at more than $500,000.

ERIE.—In order to relieve the congested condition of the trolley lines through the manufacturing districts, the civic organizations of Erie, through a joint city planning committee, have engaged trolley experts, E. P. Goodrich and F. Von Z. Lane, of New York, to make a complete survey and recommendations. As the General Electric Co., Erie Works, will add 2,500 employes before the winter season and the other factories will increase capacity, two double track cross city lines are contemplated. The General Electric Co. officials have stated that inadequate trolley facilities have kept them from employing more than 1,000 additional men in Erie this year.

HAMBURG.—The Hamburg Boiler Works advises that it expects to install a flanging clamp with hand wheels, which will allow large sheets to be flanged. At present the company has an eight-foot clamp, with screws at one end, for raising and rolling the upper clamp. Henry Seiders, proprietor.

INDIANA.—Contracts have been let for construction of the Indiana State Normal School. The McGinnis Co., Pittsburgh, has the general contract. The Harrisburg Foundry & Machine Works will furnish two engines of 75 and 115 horsepower, to be direct connected to General Electric generators of 50 and 75 kilowatt alternating current.

JOHNSTOWN.—The Davis Brake Beam Co. advises it is building and equipping new shops at Johnstown. Two shop buildings will be 80 x 55 feet and a power house will be 20 x 30 feet. New equipment purchased consists of one Deming vertical triplex pump, delivering 90 gallons per minute at 1,600 pounds per square inch pressure; one 125-horsepower motor with variable speed-control; one Watson-Stillman hydraulic accumulator, 10-inch by one foot stroke, and various small motors and equipment for handling material. The company will move from Wilmington its extensive hydraulic equipment for making the Davis solid truss brake beam and pressed steel journal box lids. In addition to this the company is building a machine to make any trussed brake beam on which patents have expired.

OIL CITY.—The Joseph Reid Gas Engine Co. recently completed the erection of a building, 75 x 102 feet, to be used as a brass foundry and for storing castings, and an addition to its machine shop. The company has under construction a new blacksmith shop, 55 x 105 feet. The company advises that these buildings became necessary through an increased demand for its products.

PHILADELPHIA.—The contract for a new bridge over the Jersey Central tracks at Laurel Run Boulevard, Wilkes Barre, to cost $2,285, has been awarded to S. W. Newberry.

PHILADELPHIA.—The Harrock Iron Works has taken out a building permit to strengthen the floor of the Philadelphia Inquirer building, at 1100 Market street, at a cost of $900.

PHILADELPHIA.—Application will be made June 16 for the incorporation of the Richard De Cou Co., to buy, sell, manufacture and deal in iron, steel and other metals. Applicants are I. Edward Bowen, John J. Crowers and Fenton H. Middleton.

PHILADELPHIA.—The Davis Lupton's Sons Co. has completed an addition to its plant, 70 x 410 feet, of the "Pond" type of construction. The machinery to be used in this building is on hand ready to install.

PHILADELPHIA.—The J. W. Paxson Co., 1021 North Delaware avenue, manufacturer of foundry supplies and equipment, advises that the cupola business is very active. Recent shipments include a 67-inch cupola, 100 feet high to the Brown & Sharpe Mfg. Co., Providence, R. I., and two 102-inch cupolas, 25 tons melting capacity, to the McWane Iron Works, Anniston, Ala.

PITTSBURGH.—The Babcock & Wilcox Co. has taken an order from the Consolidated Ice Co., Pittsburgh, for three 250-horsepower boilers with chain grate stokers, manufactured by the Green Engineering Co.

PITTSBURGH.—The Riter Conley Mfg. Co. has taken a contract from the Trumbull Steel Co., Warren, O., for a 100-foot extension to the galvanizing end of the warehouse and galvanizing building.

PITTSBURGH.—The Stonewall Iron Co. has been incorporated to own, sell and develop timber lands of all kinds; $510,000; by J. L. Cake, Pittsburgh; J. W. Howarth, Scranton, Pa.; I. M. Thomas, Wilkes Barre, Pa.

PITTSBURGH.—The Wilson-Snyder Mfg. Co. recently sold two 10,000,000 gallon, turbine drive, centrifugal pumps for installation at the Edgar Thompson works at Braddock. Another pump of the same description has been sold for installation in a Cuban sugar works.

PITTSBURGH.—The J. P. Koehler Co., smelter and refiner of metals, advises it will build a smelter works, fireproof steel construction, 72 x 100 feet, on a site recently purchased. Contracts for new machinery totaling $6,000 have been let. Bids on the building will be asked in about a week.

ROYERSFORD.—Capitalization of recent improvements which have been made necessary to take care of an enlarged business is reported by the Royersford Foundry & Machine Co., manufacturer of punches and shears, as the reason of its recent increase of capital stock to $300,000. Considerably more capital has been put in the business. During the past six months the company has

installed much new machinery but is not in the market for equipment at present.

TITUSVILLE.—The Titusville Iron Co. is installing a complete automatic sprinkling system in its plant, at a reported cost of $15,000.

## SOUTH CAROLINA

GEORGETOWN.—The directors of the Atlantic Coast Lumber Corporation, New York City, have decided to rebuild on the site of their former plant, recently destroyed by fire. The new mill will be equipped with new machinery and operated by electric power. It will have a capacity of 750,000 feet of lumber per day.

## TENNESSEE

HARRIMAN.—N. C. Blanchard, of Crab Orchard, will establish a plant here for the manufacture of spokes. Power and woodworking machinery, principally lathes, will be needed.

LEWISBURG.—The plant of the Lewisburg Foundry Co. is being rushed to completion.

MORGANTOWN.—Samuel S. B. Brady, Morgantown, chief engineer of the Buckhannon & Northern railroad, has arrangements well under way for extending the road from Rivesville to Fairmont, including the construction of a bridge 1,000 feet long.

## TEXAS

DALLAS.—The New Century Milling Co., which recently sold its present property to the Union Terminal Co., is rushing the work on its new mills at Cadiz and Santa Fe streets. As soon as the New Century company can move into its new quarters, active work of preparing the ground for the new $3,000,000 union depot will be commenced.

HOUSTON.—Contracts for the San Jacinto steel bridge will be awarded soon, according to Mayor Campbell. This bridge will be a permanent structure, costing approximately $130,000.

McKINNEY.—The local lodge of the I. O. O. F. has purchased a building site and is planning to begin the erection of a four-story brick and steel building soon.

SAN ANTONIO.—The International Irrigation Co. has been organized to manufacture pumping machinery, and expects to locate its plant in San Antonio.

SAN ANTONIO.—E. A. Holmgreen, secretary and treasurer of the Alamo Iron Works, advises that the city of San Antonio has under consideration a bond issue of $3,500,000, for street paving, sewers, bridges, fire houses, etc., which will be voted upon within the next month, and that from general indications it will carry.

TEMPLE.—The Temple, Northwestern & Gulf Railway Co. has been incorporated to construct and operate a line of road from Temple in a northwestern direction, through the counties of Bell, Hamilton, Corydell, Comanche and Erath, to the city of Dublin, a distance of approximately 100 miles; $100,000; by J. H. Thompson, J. F. Sadler, J. Lane, Houston; A. S. Vandevoort, J. R. Thompson, W. A. Vinson, all of Houston, and W. S. McGregor, W. F. McGregor, Temple.

WACO.—The Praetorians, a fraternal insurance association, of Dallas, has announced that it will begin the construction of an eight-story steel office building at this place soon.

## VIRGINIA

DANVILLE.—The Danville Machine Works recently moved into its new plant at 215 Lynn street. J. C. Holcombe, manager.

RICHMOND.—The Tredegar Iron Works has been awarded the contract for $400,000 worth of steel projectiles and shells by the United States War Department.

## WASHINGTON

BENTON CITY.—The bid of Nettleton-Eschbach-Bruce Co., of North Yakima, for $125,000 for Sunnyside irrigation project has been recommended by chief engineers.

BOSSBURG.—The plant of the Williams Lumber Co., at Williams, four miles north of here, was destroyed by fire with a loss of $25,000. Will be rebuilt.

CONNELL. — The county commissioners have awarded contract for new county jail with steel interior to F. E. Van Dusen, of this city.

COPALIS.—With a capitalization of $100,000 the Copalis Lumber Co. has been incorporated here by William Carlisle, George W. Pennell, A. P. Sprague and George Dysart. Plans call for erection of large mill shortly.

EVERETT.—The contract for building the steel bridge across Evey slough has been awarded to the International Bridge Co., Everett and Seattle, for $30,568.

ILWACO.—Bids will be called soon for municipal water system for which bonds were voted recently.

KITTITAS.—Announcement has been made that the Clerf estate of Ellensburg will pipe water from Wark springs, 3 miles from here to local water mains. Pipe line and headworks will cost $20,000.

LOWELL.—The Puget Sound Wood Preserving Co. will double the capacity of its plant, according to announcement of officers.

OLYMPIA. — The Olympia Water Works Co. has purchased land for reservoir and stand-pipe site. Construction work will begin soon.

OLYMPIA.—An ordinance has been introduced in the council calling for a special election to vote $150,000 in bonds to build a municipal water plant in the Black hills.

RIDGFIELD.—The Independent Electric Co. has applied to the city council for a franchise to sell light and power in this city.

SEATTLE.—The council and board of public works has awarded contract for laying water mains in North 82nd street to T. Ryan, 407 Lowman building, for $26,322.

SEATTLE.—The plans and specifications for the Ford Automobile assembling plant to be built here at a cost of $400,000 are finished. Bids were received on building June 10. Considerable machinery will be bought.

SEATTLE.—The Irrigation Pump & Land Co., with offices in the Crary building, is planning the construction of a plant at this place, for the manufacture of a patented irrigating pump. John C. Slater, president.

SEATTLE.—The Union Machinery & Supply Co. recently contracted for the complete machinery equipment of the new saw mill being built at Port Angeles, Wash., by the Puget Sound Mills & Timber Co. This mill is estimated to cost $1,000,000.

SPOKANE.—The Montana Mining Co. has been incorporated; $1,000,000; by J. O. Hamilton, D. E. Budns, Fred Laudwein and E. B. Wingard.

SPOKANE.—The chamber of commerce has secured the location here of the plant of the new automobile company recently incorporated, which affects the Mack Machinery Co. and the Spokane Auto Parts Co. The new company plans to enlarge the present plant of the auto parts company. The incorporators are E. A. Torrence, of the Torrence Investment Co., P. H. Witschge and R. L. Dickerson, of the Spokane Auto Parts Co., and W. P. Edris.

TACOMA.—The city council has instructed the commissioner of light and water to rebuild the 2,100-foot, 8-inch cast iron pipe line across the new Eleventh street bridge which has just been completed by the International Contract Co. for $600,000. The bridge has not been accepted by the city. Cost of new pipe will be deducted from amount due company.

TOPPENISH.—The plans for the $500,000 Satus irrigation project have been approved by Chief Engineer Reed and construction work will start soon.

## WEST VIRGINIA

HUNTINGTON.—The officials of the Chesapeake & Ohio railway shops at this place are considering the use of natural gas as fuel throughout the plant.

NEWELL.—The Birch Machine Co. started operations on its new plant here recently.

PARKERSBURG. — The city council will receive bids until July 2 for the following second-hand machinery: Two vertical duplex pumps, 12 x 12-inch water ends, 18 x 24-inch steam ends, rated capacity, one million gallons each; one horizontal compound duplex plunger pump, rated capacity, two million gallons, 12-inch suction, 12-inch discharge; one horizontal duplex compound pump, size 19 x 24 x 15 x 24-inch, rated capacity, two million gallons, 13-inch suction, 12-inch discharge; two 80-horsepower return tubular Titusville boilers; one 80-horsepower return tubular Erie boiler; one 250-horsepower Atlas water tube boiler; three metal boiler stacks; two boiler feed pumps; one water heater.

WHEELING.—The J. E. Moss Iron Works has been incorporated; iron and stone; $100,000; by J. A. Moss, E. A. Moss, W. E. McKibben of Wheeling, and H. M. Naugle, of Canton, O.

## WISCONSIN

LA CROSSE.—The Industrial Association is raising funds for a plant for the Hans Motor Equipment Co. in this city. About $20,000 will be required.

MILWAUKEE.—The Vilter Mfg. Co. reports a large list of recent sales, including a 14 x 30 inch rolling mill tube Corliss engine to the Federal Pressed Steel Co., Milwaukee.

MILWAUKEE.—The Badger Pattern Works has been incorporated by George Luber, Dell Dennis and W. L. Witthun. The capital stock is $3,000. A small pattern shop will be opened at once.

MILWAUKEE.—The Great Lakes Salvage Co. has been incorporated to manufacture wrecking machinery; $7,000; by William Schlosser, W. G. Smith and J. E. Wildish, all of Milwaukee.

RACINE.—Earl Aber and K. Thompson have organized and will soon incorporate the Wisconsin Foundry Co., for which a foundry, 60 x 80 feet, is now in the course of erection at the Junction, near the site of the old Racine Refrigerator plant.

WAUKESHA.—The board of public works is taking bids for the erection of the new city hospital which will cost in the neighborhood of $75,000.

## WYOMING

CHEYENNE.—The Cheyenne Railway Supply Co. has been incorporated; $25,000; by J. D. Clark.

# DOMINION OF CANADA

## ALBERTA

CALGARY.—A by-law has been passed to provide for a trunk sewerage system at a cost of $527,660. J. M. Miller is city clerk.

CALGARY.—Refrigerating machinery will be purchased by the Crystal Ice Co., which intends to erect a large ice plant here, as well as a skating rink.

CALGARY.—Laundry machinery, water supply and lighting system and septic tank will be required for a new college which is being erected at a cost of $53,000 for St. Benedict College trustees.

CALGARY.—The Canadian Stewart Co. has secured the contracts for a 5,000 000 bushel elevator at Calgary for the Canadian Malting Co., and another at Medicine Hat for the Ogilvie Flour Mill Co.

CALGARY.—Estimates of the cost of five concrete bridges to be built by the city across the Bow river have been prepared by City Engineer Creig and call for an expenditure of $1,457,000. His report states that these bridges could be built of steel for $1,161,000, but he has advised against this, claiming that the steel would not have so long a life as the concrete, and would not last more than 30 years.

EAST CALGARY.—The factory of the Calgary Woodworkers, Ltd., has been purchased by the Hudson Bay Co., in which to manufacture fittings, etc., necessary for its many stores in Canada, and will be in the market for more machine tool equipment.

## BRITISH COLUMBIA

ARMSTRONG.—The lumber mill of T. K. Smith, was damaged in a fire a few days ago. The lumber was saved, but the mill machinery, including boilers, engines and electrical machinery, was ruined. The damage is placed at $10,000, with some insurance.

BURNABY.—A by-law will shortly come before the citizens for ratification which authorizes the town to spend $200,000 for constructing extensions to the general water work system.

ESQUIMAULT.—Plans and estimates for the proposed sewerage system for Esquimault prepared by C. H. Topp show that it will cost in the neighborhood of $385,000.

MERRITT.—The city proposes to spend $5,000 for completing the present water works system, $5,000 on the electric lighting system, and $40,000 for erecting buildings, installing a pumping plant and reservoir and laying water mains.

NEW WESTMINSTER.—A permanent steel bridge with a 20-foot roadway, and two six-foot sidewalks, has been ordered by the Railway Board between Burnaby and Coquitlam. The Great Northern railway must construct the bridge, which will be 600 feet long.

PORT COQUITLAM.—A shingle mill will be erected on the Pitt river by Messrs. Dewar and Cutler, of Vancouver, which will have a capacity of 100,000 shingles a day. W. B. Cutler is manager of the concern.

REVELSTOKE.—The town has been authorized by the citizens to spend $15,000 on improvements to the water works system.

VANCOUVER.—Plans will be prepared for a comprehensive sewerage scheme for the districts of Edmonds, East and North Burnaby, B. C. Municipal Engineer McPherson will do the work.

VANCOUVER.—The Burrard Inlet Bridge & Tunnel Co. recently held a meeting of the directors for the purpose of arranging for another meeting for the election of new directors, held to discuss the financial condition of the company.

VANCOUVER.—The Franco-Canadian Credit Foncier Co. is having plans prepared for a building, 50 x 120 feet, 10 stories, to cost $334,000. H. L. Stevens & Co., 119 Pender street west, Vancouver, architects, state that they would be pleased to receive communications from American exporters of building and construction materials.

VANCOUVER.—The Canadian Bridge Co., Ltd., Walkerville, Ont., has been given the contract for the superstructure metal for the bridge at Lytton, B. C. The Graff Construction Co., of Vancouver, will build the substructure and the erection of the superstructure. The steel superstructure will include one span of 250 feet, two 70-foot spans and one 50-foot deck plate girder span. The bridge will cost about $80,000.

VICTORIA.—Exclusive of large expenditures on new local terminals in Victoria, the Canadian Pacific railway will spend a million and a half on its system on Vancouver Island this year. H. Beasley is general superintendent of the island division.

## MANITOBA

WINNIPEG.—Grant, Smith, McDonald & Co., of Vancouver, have been given the contract for the construction of three portions of double-tracking on the main line, between Revelstoke and Taft, B. C.; Walmore and Kamloops and Tranquille. Work will immediately commence.

## NEW BRUNSWICK

CAMPBELLTON.—The city electric light department have been authorized to get prices on a gas producer. The firm which supplied the remainder of the equipment has quoted $5,490, which the council considers too high.

McADAM JUNCTION.—The contract for the erection of the new shops the Canadian Pacific railway will build at McAdam Junction has been awarded to Henry Post, of Woodstock, who will start work at once.

ST. JOHN.—The first steel out of Fredericton on the St. John Valley railway was laid last week and work on this new road, which will be a big railway factor in New Brunswick, will be pushed ahead rapidly. Several large steel bridges will be involved

## NOVA SCOTIA

AMHERST.—Fire totally destroyed a building owned by the Maritime Coal, Railway & Power Co. in Amherst on June 1, and wrecked the electric light station. The loss was $25,000.

HALIFAX.—To provide money for development purposes, the Nova Scotia Car Works' directors have decided to issue $200,000 of additional first preferred stock.

## ONTARIO

CANNINGTON.—A plant will be built by the village authorities to distribute electric power to be supplied by the Hydro-Electric Power Commission of Ontario, at a cost of $12,000.

COBALT.—The directors of the Casey Cobalt mine have decided to increase the capacity of their concentrator from 25 tons per day to 75 tons, and to install electric power.

DUNDAS.—The Canadian Abrasive Wheels, Ltd., has purchased a site of eight acres and agrees to erect buildings at a cost of not less than $20,000, the town to guarantee its bonds to the extent of $15,000.

FORT WILLIAM.—The Canada Iron Corporation has received a contract from the city of Regina, Sask., for 4,000 tons of cast iron pipe to be used in connection with the new water-works.

FORT WILLIAM.—The Canadian Pacific railway is contemplating the installation of a new system of handling freight and has in view the purchase of several electric motor trucks

FORT WILLIAM.—The Steel Co. of Canada has commenced the erection of a wire nail plant to cost $325,000, having taken over the interests of the Maritime Nail Co., which had secured a 10-acre site for the purpose. Prack & Perrine, of Hamilton, have charge of the construction work. The buildings will be of brick and steel construction with cement roof. Mill No. 1 will be one story, 50 x 250 feet; mill No. 2 one story, 100 x 150 feet; mill No. 3 one story, 100 x 125 feet; the warehouse two stories, 75 x 175 feet, and the power house one story, 75 x 175 feet.

GRIMSBY.—The Gravenhurst Iron Specialty Co. will build a large plant here as a result of a by-law recently passed by the ratepayers authorizing the town to loan it $10,000.

HAMILTON.—A plant to cost $1,500,000 will be erected in Hamilton by the Ontario Pipe Line Co., which proposes to produce 5,000,000 cubic feet of gas per day.

HAMILTON.—The Dominion Power & Transmission Co., which at present generates its supply of electric power at Deceu Falls, will build an auxiliary steam plant to cost about $1,000,000, as the Deceu Falls plant is frequently tied up by ice.

HAMILTON.—The Smart-Turner Machine Co., Ltd., has been recently awarded contracts for the supply of one steam engine driven pump to the Thunder Bay Contracting Co., of Port Arthur, and of one triplex power pump for the Dominion Abattoir Co., Ltd., of London.

KINGSTON.—The city council is applying for power to spend $34,000 on extensions and improvements to the city gas and electric light and power works.

LONDON.—Ald. J. C. Richter has been in New York inspecting various makes of storage battery cars with a view to collecting data for the electrification of the London & Port Stanley railway, owned by the city of London.

NIAGARA FALLS.—The street lighting system of the town being insufficient, the council propose to spend a thousand dollars on extensions.

ORILLA.—It is the intention of the town council to spend $58,000 in bringing a supply of water from Lake Couchiching. They will build a pump house at $6,000, and spend $7,600 on a 1,000-gallon per minute turbine pump with electric motor, and a 150-horse-power boiler.

OTTAWA.—Tenders have been called for the first section of the new $50,000,000 Welland canal. There will be altogether seven locks, each 46½ feet deep, 80 feet wide and long enough to accommodate an 800-foot vessel. The work is to be completed in five years.

OTTAWA.—A contract has been entered into between the Canadian post office department and the Dominion of Canada Postage Stamp Vending Co., by which the company

agrees, without any cost to the department, to erect pillar boxes in public places which will combine a stamp-vending compartment and a receptacle for the mailing of letters. The pillars are of circular design, standing about 8 feet high.

OTTAWA.—It is officially announced that the Canadian government has decided to erect two interior storage elevators at Moose Jaw and Saskatoon with a capacity of 3,000,000 to 4,000,000 bushels each, and to cost about $1,000,000. The location for the elevators to be erected in Alberta has not yet been decided. A big transfer elevator will also be erected on the Pacific coast to be owned and operated by the government. A terminal elevator of large capacity will be built at Port Nelson on Hudson Bay. An appropriation of $4,000,000 has been provided so that the work can proceed at once.

OTTAWA.—During the coming summer the construction of the quay walls and the railway in connection with the enlarged railway terminals for the Intercolonial railway at Halifax will start. This part of the scheme will cost $1,250,000, while the whole plan will total $12,000,000. The proposed terminal will consist of a bulkhead wharf 2,000 feet in length, large enough for three of the largest ocean vessels to dock at without difficulty; a wharf building along the pier's length including freight and immigration sheds and a passenger station. Six freight piers 300 feet wide by 1,250 feet long will be built as well as an elevator, a locomotive house and a breakwater.

OTTAWA.—The Canadian Pacific Railway Co. has awarded a contract to the John S. Metcalf Co., Ltd., Montreal and Chicago, for the construction of all the buildings along the new line of the C. L. & O. W. railway, about 180 miles in length, extending from the present main line at Glen Tay, Ont., near Smith's Falls, to the main line at Agincourt, near Toronto. The contract includes seven brick stations, 12 wooden stations, nine 40,000-gallon water tanks, a 12-stall engine house with turn table, machine shop, coaling plant, ash pit and sand house; seven station residences, nine freight sheds, an ice house, twenty-five tool houses and miscellaneous buildings, a total of 85 structures. All will be ready by the end of the year.

SARNIA.—The Standard Oil Co. will spend a large amount this summer to increase the capacity of its large plant. New boiler houses are being built and a big concrete dock on the water front to be supplied with machinery for handling coal and oil. Work has commenced on the pipe line for bringing crude oil from the Ohio fields to Sarnia.

SAULT STE. MARIE.—Plans for the extension of the Lake Superior Steel Corporation plant provide, it is announced, for the doubling of the different departments of the corporation's activities, at a cost of about $16,000,000.

ST. CATHERINES.—The city council have been authorized by the ratepayers to expend $10,000 to extend the mains of the city's gas plant.

ST. THOMAS.—The Western Ontario Electric Co., Ltd., has been incorporated to manufacture lighting fixtures, electric goods, etc.; $25,000; by Chas. A. Branston and Christopher F. Goodwin, of St. Thomas, and others.

TORONTO.—The Taylor Stoker Co., Ltd., with a capital of $40,000, has been granted a charter to make stokers and parts. Harry W. Hand and Godfrey R. Rehmann, both of Philadelphia, are among the incorporators.

TORONTO.—The Herbert Morris Crane & Hoist Co., Ltd., will carry on business as iron founder, mechanical engineer, manufacturer of lifting machinery, motors, motor cars, etc.; $100,000; by James S. Lovell, William Bain, and others, of Toronto.

TORONTO.—The Toronto Harbor Commissioners have decided to award the contract for dredging to the Canadian Stewart Co., of Montreal. As soon as the company has its plant in readiness the work of deepening the harbor to a depth of from 30 to 35 feet will be commenced, which will require the dredging of about 31,270,000 cubic yards.

TORONTO.—The Canadian Northern railway will run a tunnel 2,360 feet in length from a point near the Canada Foundry, of sufficient width to allow of two tracks, and will cross the Humber river by means of a high level bridge. It will cost between $300,000 and $500,000, will be 30 feet wide and 25 feet deep, of brick or cement construction.

TORONTO. — The mammoth hydraulic dredge built for the Canadian government at the Polson Iron Works for operation in Hudson Bay, was launched on May 31, and christened the "Port Nelson." It was designed by Wm. Newman, manager of the Polson works, and cost $270,000. The dredge will commence operations in dredging the harbor at Port Nelson this summer.

WASDELL'S FALLS.—Tenders will be received by Hon. Adam Beck, chairman of the Ontario Hydro-Electric Commission, until June 16, for work in connection with the construction and equipment of a hydro-electric power plant at Wasdell's Falls, on the Severn river, as follows: dam and power house; electrical and hydraulic equipment; crane, stoplog winch and head gate mechanism.

WALLACEBURG.—By-laws have been adopted to provide for an expenditure of $130,000 for a water works and sewerage system.

WELLAND.—The Electric Steel & Metals Co., Ltd. has been incorporated; $500,000; by Robert Turnbull, James H. Lefevre and Byron J. McCormick, provisional directors.

WINDSOR.—The citizens on May 30 adopted four industrial by-laws granting exemption from municipal taxation to the Swedish Crucible Steel Co., Kelsey Wheel Co., Detroit Steel Products Co., and Vincent Steel Process Co., all of which will now proceed with the erection of their respective plants.

## QUEBEC

CHICOUTIMI.—Incorporation has been granted to La Societe d'Eclairage et d'Energie Electrique du Saguenay with a capital of a million dollars, to supply electric power and artificial and natural gas to the districts of Roberval, Chicoutimi, Saguenay, Three Rivers, Rimouski, Gaspe, etc., with headquarters at Chicoutimi. Among the incorporators are Julien E. A. Dubuc, Francois Xavier Gosselin and others, of Chicoutimi.

MONTREAL.—The contract for the underground conduits which will be installed by the city has been awarded to J. M. Gest, of Montreal, at $98,000.

MONTREAL.—The work of finishing the double-tracking of the Canadian Pacific railway's main line between Montreal and Farnham, Que., has been commenced and will be finished by December next.

MONTREAL.—Galbraith & Craig have been awarded a contract by the city council of Guelph for the erection of a concrete bridge across the Speed river at a cost of $10,000.

MONTREAL.—An order for a 100-kilowatt steam driven exciter set for the City of Edmonton has been secured by James Howden & Co., Ltd., of Glasgow, Scotland, with agency in Montreal. The company has also supplied the Canada Iron Corporation with two engines, the Robert Simpson Co., of Toronto, with one, as well as Nanaimo, B. C., and other customers.

MONTREAL.—In order to cope with the demand for dining, sleeping, parlor and observation cars, orders are being placed by the Canadian Pacific railway for nearly 200 additional cars for service this season. Most of the standard cars are built at the Angus shops in Montreal, but orders have had to be placed outside as well. The company intends to place in commission 94 additional standard sleepers, 25 diners, 10 buffet observation, 12 observation and 56 tourist cars.

MONTREAL.—A special meeting of the shareholders of the Canadian Venezuelan Ore Co. has been called for the purpose of increasing the bond issue of the company by issuing $500,000 new bonds to provide funds to fully develop the property in Venezuela. The money will also be used to purchase additional air compressors, trams to loading piers, new steam shovels, etc. Two steamers are now operating on time charter for the company, carrying ore from the mine to delivery ports, and two more will be put in operation in July.

## SASKATCHEWAN

REGINA.—The National Meter Co. has been awarded a contract for supplying the city with 1,400 water meters at $25,000.

REGINA.—Tenders will be called by the city shortly for building a large power house, which is to be equipped with a number of large boilers. Works Commissioner Thornton is in charge of the work.

REGINA.—The Egon von Parpart Co. is negotiating with the city council with a view to locating a sand lime brick plant here, the structure for which will cost $20,000 and the machinery $80,000.

REGINA.—The city council will shortly be in the market for material to construct trunk mains as an extension to the water works system. On Wednesday, June 11, the ratepayers will decide whether $100,000 may be expended for this purpose.

SASKATOON.—The Metal Shingle & Siding Co. is preparing plans for the erection of a $250,000 plant here, to be built on the industrial site.

SASKATOON.—The new power house at the corner of Avenue B and Spadina Crescent will be extended at a cost of $15,000 to provide for the increasing demand for power. J. F. O'Leary, architect.

SASKATOON.—Lonergan & Hansford have the general contract for the construction of four miles of street railway for the Saskatoon-Sutherland Construction Co. Sixty pound rails will be laid.

SASKATOON.—The Western Foundry & Machine Co. will be in the market for machine tool equipment, having re-built the foundry, machine shop and pattern making shops which were burned to the ground some weeks ago.

SASKATOON.—The Atlin Railway Co. will be incorporated by the Dominion Parliament next session to build a line from Atlin to the international boundary. The Naas Valley & Northern Railway Co. is another line which will build considerable trackage in Saskatchewan.

SASKATOON.—Local capitalists including W. D. Hale and A. C. Harris of the Hale-Harris Co., are interested in a concern known as the Perfect Removable Bar Cylinder Co., which is negotiating with Saskatoon to establish a factory here. The company owns world patent rights for the manufacture of an improved cylinder for use in threshing machines and has been incorporated in Spokane, Wash., but plans to transfer its activities to Western Canada.